9-2350-267-20/990

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

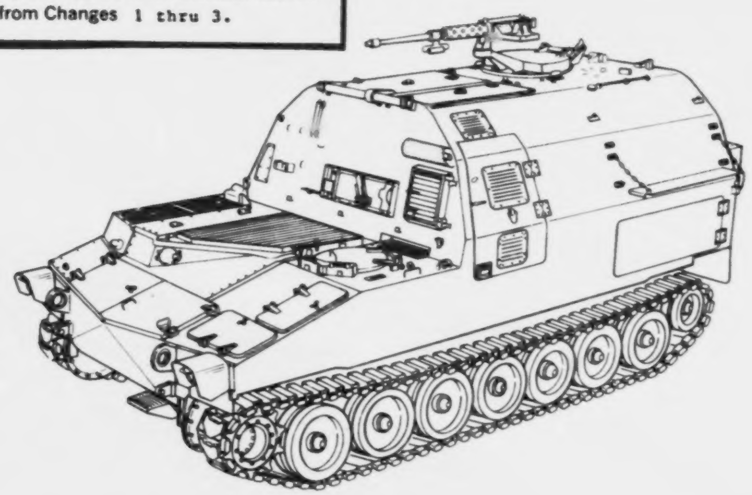
ORGANIZATIONAL MAINTENANCE MANUAL

FOR

HULL, POWERPACK, DRIVE CONTROLS, TRACKS, SUSPENSION AND ASSOCIATED COMPONENTS

CARRIER, AMMUNITION, TRACKED

This copy is a reprint which includes current pages from Changes 1 thru 3.



M992

(NSN 2350-01-110-4660)

OCTOBER 1985

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READEX FICHE best copy available

WARNING

WARNING

CARBON MONOXIDE POISONING CAN BE DEADLY

Carbon monoxide is a colorless, odorless, deadly poisonous gas which when breathed, deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, coma. Permanent brain damage or death can result from severe exposure.

It occurs in the exhaust fumes of fuel-burning heaters and internal-combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. The following precautions must be observed to ensure the safety of personnel whenever the personnel heater, main, or auxiliary engine of any vehicle is operated for maintenance purposes or tactical use.

1 Do not operate heater or engine of vehicle in an enclosed area unless it is adequately ventilated.

2 Do not drive any vehicle with inspection plates, cover plates or engine compartment doors removed unless necessary for maintenance purposes.

3 Be alert at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, immediately ventilate personnel compartments. If symptoms persist, remove affected personnel from vehicle and treat as follows: expose to fresh air; keep warm; do not permit physical exercise; if necessary, administer artificial respiration.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

TA309909

WARNING

Ammunition containing explosives must be handled with care at all times. The explosive in primers and fuzes is very sensitive to shock and high temperature. If ammunition is dropped, thrown, tumbled, or dragged, an explosion may result, causing death or injury and destruction of equipment. Disassembly of ammunition is not authorized.

WARNING

High pressure hydraulic fluid is used to operate equipment. Serious injury may result when high pressure fluid comes in contact with human skin. Shut off all hydraulic system components before performing any maintenance.

Serious injury may result from electrical burns. Before working on electrical equipment, harnesses and battery cables, turn OFF MASTER switch and disconnect battery ground cables.

After suspected NBC exposure of this vehicle, all air filter media shall be handled only by personnel wearing full NBC protective equipment.

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable.

To prevent personal injury when using PD-680:

- Use only in a well-ventilated area.
- Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention.
- Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention.
- The flashpoint for Type I dry-cleaning solvent is 100 °F (38 °C); for Type II it is 138 °F (50 °C). Do not use near open flame or excessive heat.

WARNING

Stand away from any items being removed from vehicle using lifting device to prevent personal injury.

WARNING

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when running engine in ground hop mode. Contact with rotating fan can cause injury.

WARNING

Prolonged exposure to Halon could make you dizzy. Halon can irritate your eyes and throat. After Halon discharge, vent fan in a crew compartment comes on automatically If vent fan does not come on, get all soldiers out of vehicle within 5 minutes.

WARNING

Discharging portable fire extinguisher gas can freeze your skin. Keep away from discharging gas.

WARNING

If fire occurs again due to equipment malfunction or damage, soldiers could be killed or injured and equipment could be damaged. If fire extinguishers are empty, and there is a possibility of fire occurring again, offload all ammunition.

WARNING

If Halon is discharged into engine compartment while engine is running, engine exhaust may be poisonous. Poisonous gas can injure you. If Halon is discharged while engine is running, do not breathe engine exhaust.

TA58102

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *1 November 1988*

Organizational Maintenance Manual
For
HULL, POWERPACK, DRIVE CONTROLS, TRACKS, SUSPENSION AND ASSOCIATED COMPONENTS
CARRIER, AMMUNITION, TRACKED
M992
(NSN 2350-01-110-4660)

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Index-1 thru Index-18	Index-1 thru Index-17/(Index-18 blank)

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By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

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C2

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Organizational Maintenance Manual
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M992
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M992

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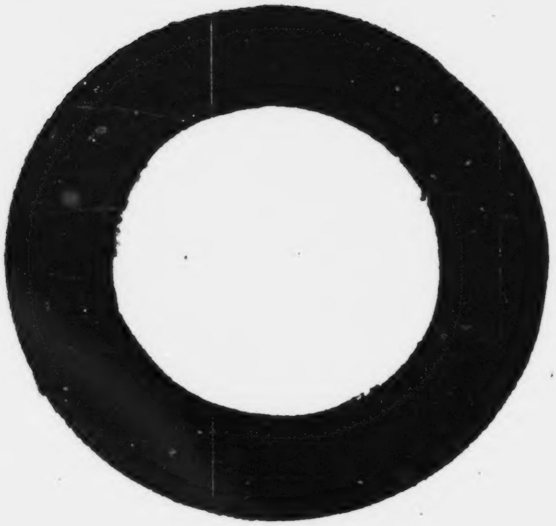

TECHNICAL MANUAL
NO. 9-2350-267-20

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ORGANIZATIONAL MAINTENANCE MANUAL
FOR
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CARRIER, AMMUNITION, TRACKED
M992

(NSN 2350-01-110-4660)

REPORTING OF ERRORS

You can improve this manual by recommending improvements using DA form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in the back of this manual. Mail the form direct to Commander, U.S. Army Tank-Automotive Command, Attn: AMSTA-MBC, Warren, MI 48397-5000.

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HOW TO USE THIS MANUAL

OVERVIEW

This manual contains organizational level maintenance procedures for the Carrier, Ammunition, Tracked M992.

These procedures are presented in 18 chapters each divided into sections.

IMPORTANT

You must read and understand the entire maintenance procedure before beginning any maintenance task.

SAMPLE PROBLEM

To help you discover the advantages of this simplified maintenance manual, a typical maintenance problem is given - just follow the steps:

STEP 1 How do you start?

Open the manual to the QUICK GUIDE TO TROUBLESHOOTING (p 2-51). Find the name of the item that doesn't work. (FOR EXAMPLE: ENGINE.)

STEP 2 What kind of problem do you have?

Find the problem with the item. (FOR EXAMPLE: DOES NOT CRANK.)

STEP 3 How do you find out what is causing your problem?

Look over the problems listed. Select the most likely problem. (FOR EXAMPLE: BATTERY-GENERATOR indicator is in red. Electrical circuits are not operating.) If you are in doubt, start at the top of the list, checking them out one by one.

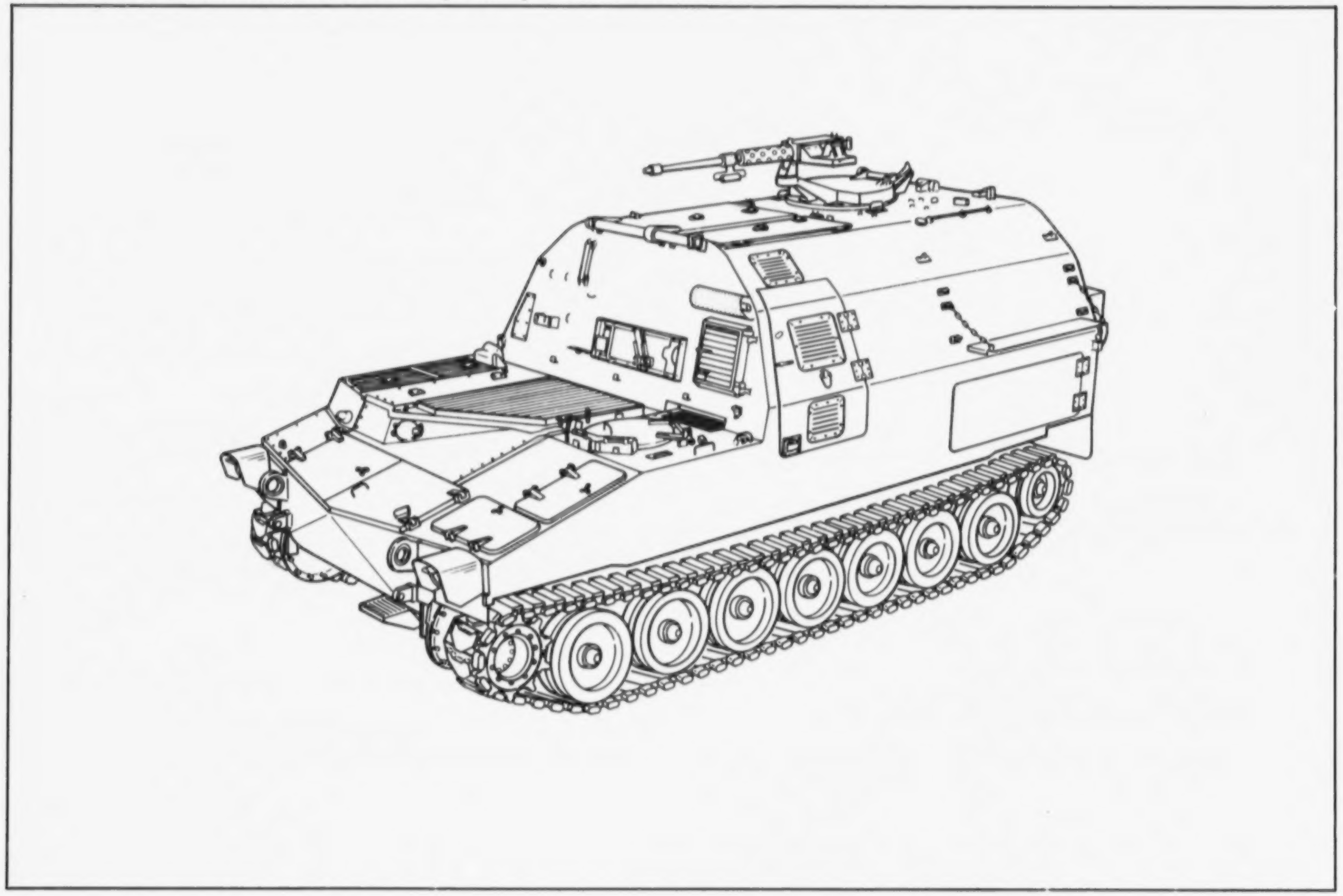
STEP 4 How do you fix it?

Do the maintenance procedure given or turn to the page referenced and follow the step-by-step procedures.

STEP 5 If you can't find or fix the problem, notify Support Maintenance.

TA309915

M992, CARRIER, AMMUNITION, TRACKED (155mm) — LEFT FRONT VIEW



TA309916

CHAPTER 1
INTRODUCTION

Section I GENERAL INFORMATION

GENERAL INFORMATION

This manual contains instructions for organizational level maintenance of the M992.

- Appendix A, References: Lists current references, including supply and technical manuals, forms and other applicable publications that apply to the M992 vehicle.
- Appendix B, Maintenance Allocation Chart (MAC): Lists maintenance functions for vehicle components/assemblies, tools and equipment, work time figures and maintenance level assignments.

NOTE

If a repair procedure, modification or adjustment is beyond the scope and/or facilities of Organizational Maintenance, the Direct, General or Depot Maintenance unit should be notified so that trained personnel with suitable tools and equipment may be provided or further instructions issued. Replacement or adjustment of parts or major assemblies that are normally support maintenance operations, may be done by Organizational Maintenance in an emergency, if permission is obtained from the responsible commander. A replacement part or assembly, tools needed for work and special instructions should be obtained from the supporting maintenance unit.

- Appendix C, Torque Limits: Lists standards, torque values and general torque information.
- Appendix D, Expendable Supplies and Material List: Lists expendable supplies and materials required to operate and maintain the vehicle.
- Appendix E, Hydraulics System Description and Schematic Diagrams: Contains hydraulic system diagram in schematic form with operational test.
- Appendix F, Electrical Schematic Diagrams: Contains electrical system diagrams in schematic form.
- Glossary: Contains definitions of terms and abbreviations.
- Index: A complete alphabetical index is provided for quick subject reference.

MAINTENANCE FORMS, RECORDS AND REPORTS: Department of the Army forms and procedures used for equipment maintenance are listed in Appendix A. Refer to DA Pam 738-750 The Army Maintenance Management Systems (TAMMS) for instructions on use of the forms.

FIELD REPORT OF ACCIDENTS: Accidents involving injury to personnel or damage to materiel will be reported on DA Form 285 (Accident Report) in accordance with AR 385-40. Explosive ammunition malfunctions will be reported in accordance with AR 75-1.

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GENERAL INFORMATION (CONTINUED)

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR): EIR can and must be submitted by anyone aware of an unsatisfactory condition with equipment design and use. It is not necessary to show a new design or list ways to improve a procedure; simply tell why the design is unfavorable or why a procedure is difficult to perform. EIR's will be submitted on Standard Form 368. Mail to Commander, U.S. Army Tank-Automotive Command, Attn: AMSTA-MBC, Warren, MI 48397-5000.

NOTE

When equipment failure occurs for any reason other than through normal wear, poor operation or accidental damage, an EIR must be submitted.

ADMINISTRATIVE STORAGE: Basic requirements for administrative storage are covered in TM 740-90-1 (Chapter 15, Section I). When materiel is stored for a limited time (not to exceed 90 days), it will be processed in accordance with TM 740-90-1. The preferred storage site for vehicles is in dry, covered sheds. When it is necessary to store materiel outdoors, protect it against the elements as prescribed in SB 740-1 and TM 743-200.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE: Refer to TM 750-244-6 for procedures on how to destroy military vehicles. Destruction of munitions is covered in TM 750-244-5-1 (conventional ammo), or TM 43-0002-33 (improved conventional ammo).

Section II DESCRIPTION AND DATA

PURPOSE OF M992, CARRIER, AMMUNITION TRACKED VEHICLE

This fully armored and tracked carrier transports 155mm ammunition at convoy speed for howitzer support in both offensive and defensive combat operations.

CAPABILITIES AND FEATURES

Quick, efficient system for loading and unloading of ammunition.

Integrated ammunition cargo compartment containing:

- Projectile storage racks
- Canister compartments
- Powered ammunition conveyor assembly
- Powered ammunition stacker assembly
- Crew seating for six, plus driver's and commander's seats

Remote start diesel Auxiliary Power Unit (APU) for continuous operation of electrical and hydraulic systems without use of main engine.

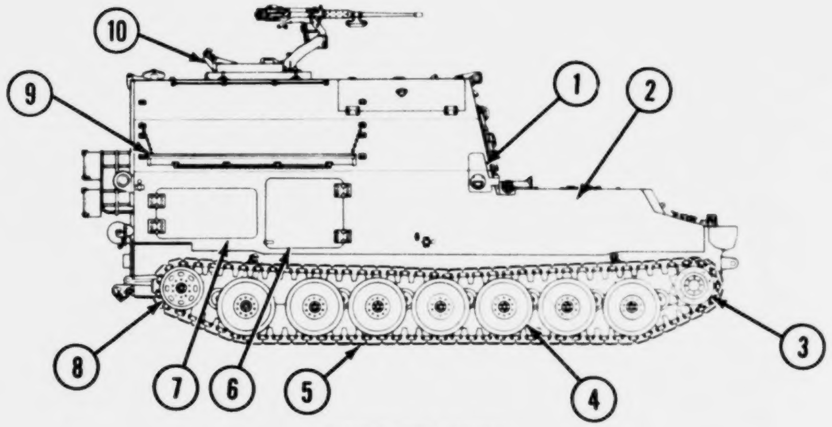
Main engine power takeoff for hydraulic system backup.

Rear door, when opened, provides overhead ballistic protection between M992 and supported howitzer.

Side doors on both sides of vehicle provide access for loading propellant charge canisters and copperhead projectiles into canister compartments.

On-board nuclear, biological and chemical (NBC) detection and protection.

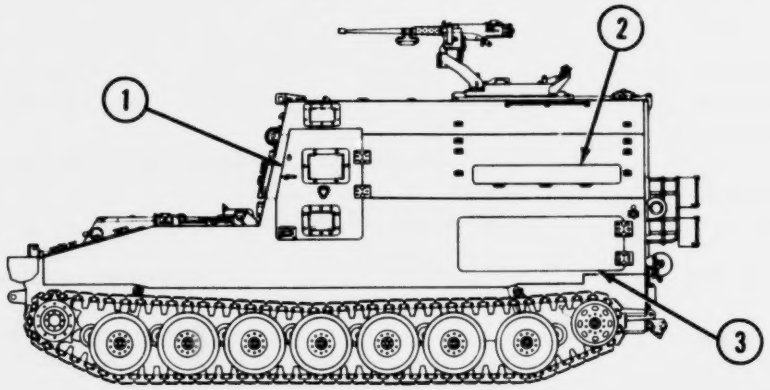
LOCATION OF VEHICLE COMPONENTS (VEHICLES 1 THRU 344) - EXTERIOR



RIGHT SIDE VIEW

LEGEND

1 Fuel fill access door
2 Hull
3 Drive sprocket
4 Roadwheel
5 Track
6 Personnel side door
7 Canister side door
8 Idler wheel
9 Duffle bag stowage rack
10 Commander's cupola

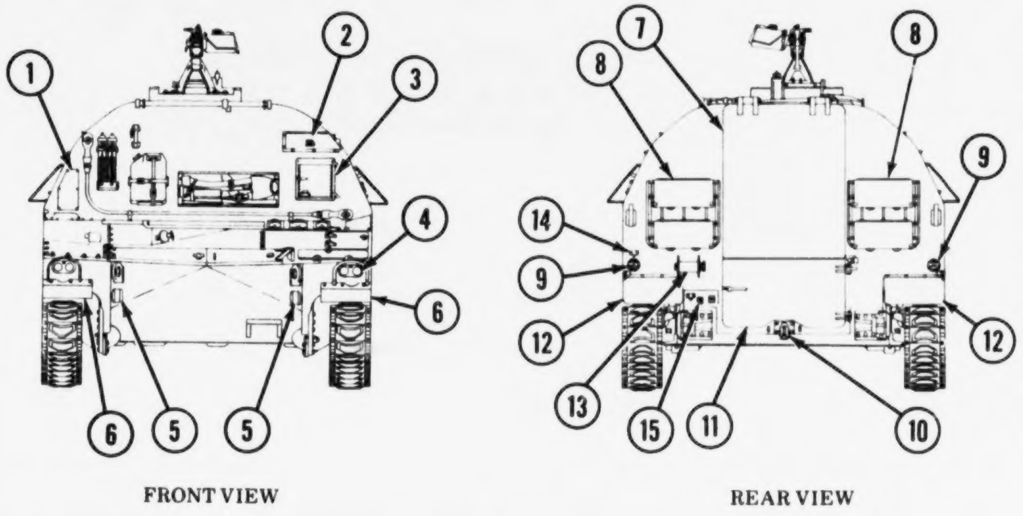


LEFT SIDE VIEW

LEGEND

1 APU door
2 Duffle bag stowage rack
3 Canister side door/copperhead projectiles

LOCATION OF VEHICLE COMPONENTS (VEHICLES 1 THRU 344) – EXTERIOR (CONTINUED)

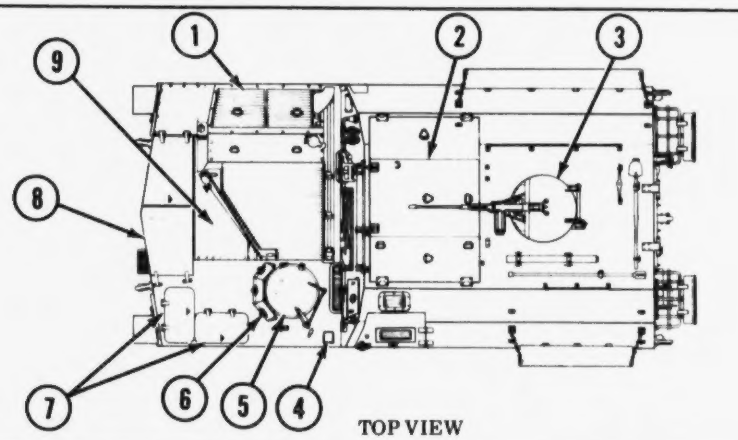


FRONT VIEW

REAR VIEW

LEGEND

1	Fuel fill filter access plate
2	APU muffler
3	APU air inlet door
4	Headlights
5	Towing lugs
6	Fenders
7	Rear door (upper)
8	Stowage racks and boxes
9	Taillights
10	Towing pintle
11	Rear door (lower)
12	Fenders
13	Telephone handreel
14	Telephone terminals
15	NBC terminals, NATO intervehicle slave connector and trailer receptacle

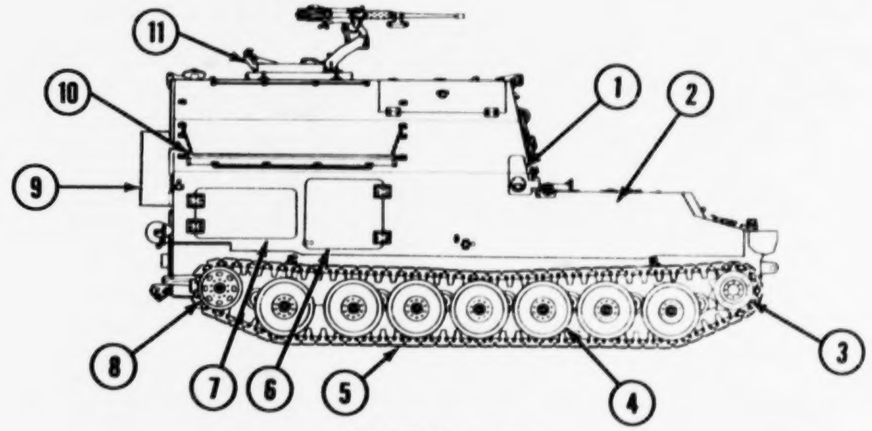


TOP VIEW

LEGEND

1	Air intake grille
2	Top doors
3	Commander's cupola
4	AFES Manual Discharge System; lanyard cable pull handle
5	Driver's hatch
6	Driver's periscope assembly
7	Battery access covers
8	Transmission access covers
9	Engine deck access plates

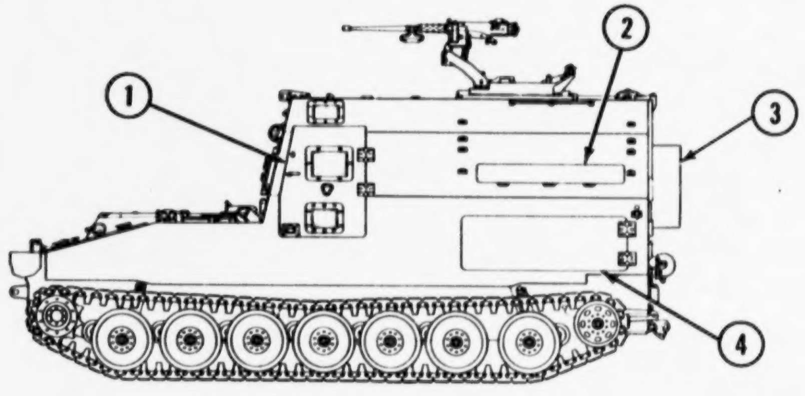
LOCATION OF VEHICLE COMPONENTS (VEHICLES 345 AND ABOVE) - EXTERIOR



RIGHT SIDE VIEW

LEGEND

1 Fuel fill access door
2 Hull
3 Drive sprocket
4 Roadwheel
5 Track
6 Personnel side door
7 Canister side door
8 Idler wheel
9 Crew AFES extinguisher box assembly
10 Duffle bag stowage rack
11 Commander's cupola

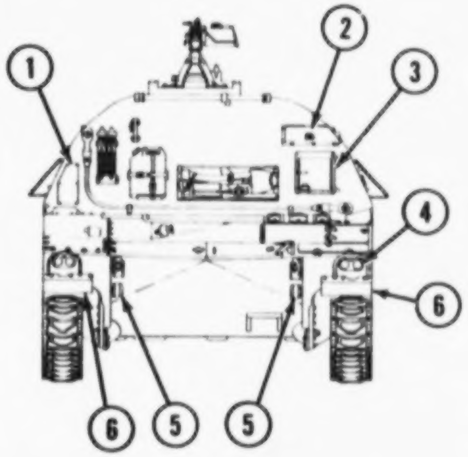


LEFT SIDE VIEW

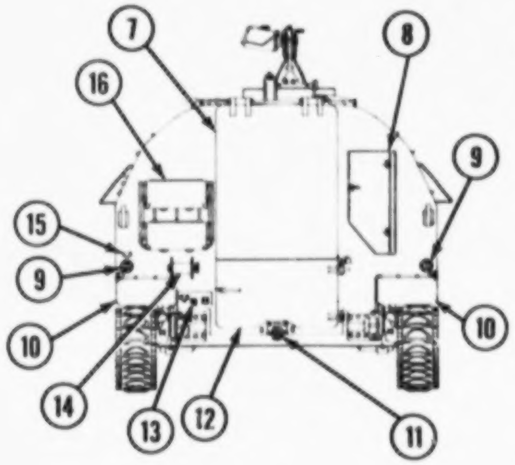
LEGEND

1 APU door
2 Duffle bag stowage rack
3 Crew AFES extinguisher box assembly
4 Canister door/copperhead projectiles

LOCATION OF VEHICLE COMPONENTS (VEHICLES 345 AND ABOVE) - EXTERIOR (CONTINUED)



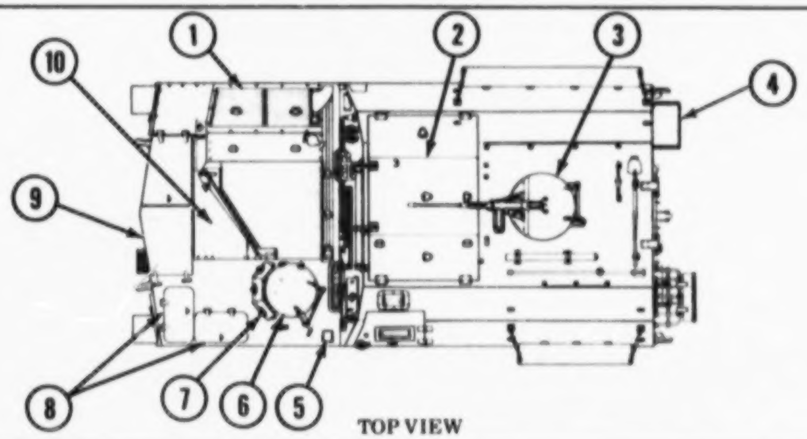
FRONT VIEW



REAR VIEW

LEGEND

1 Fuel fill filter access plate
2 APU muffler
3 APU air inlet door
4 Headlights
5 Towing lugs
6 Fenders
7 Rear door (upper)
8 Crew AFES fire extinguisher box assembly
9 Tail lights
10 Fenders
11 Towing pintle
12 Rear door (lower)
13 NBC terminals, NATO intervehicle slave connector and trailer receptacle
14 Telephone handreel
15 Telephone terminals
16 Stowage rack and boxes

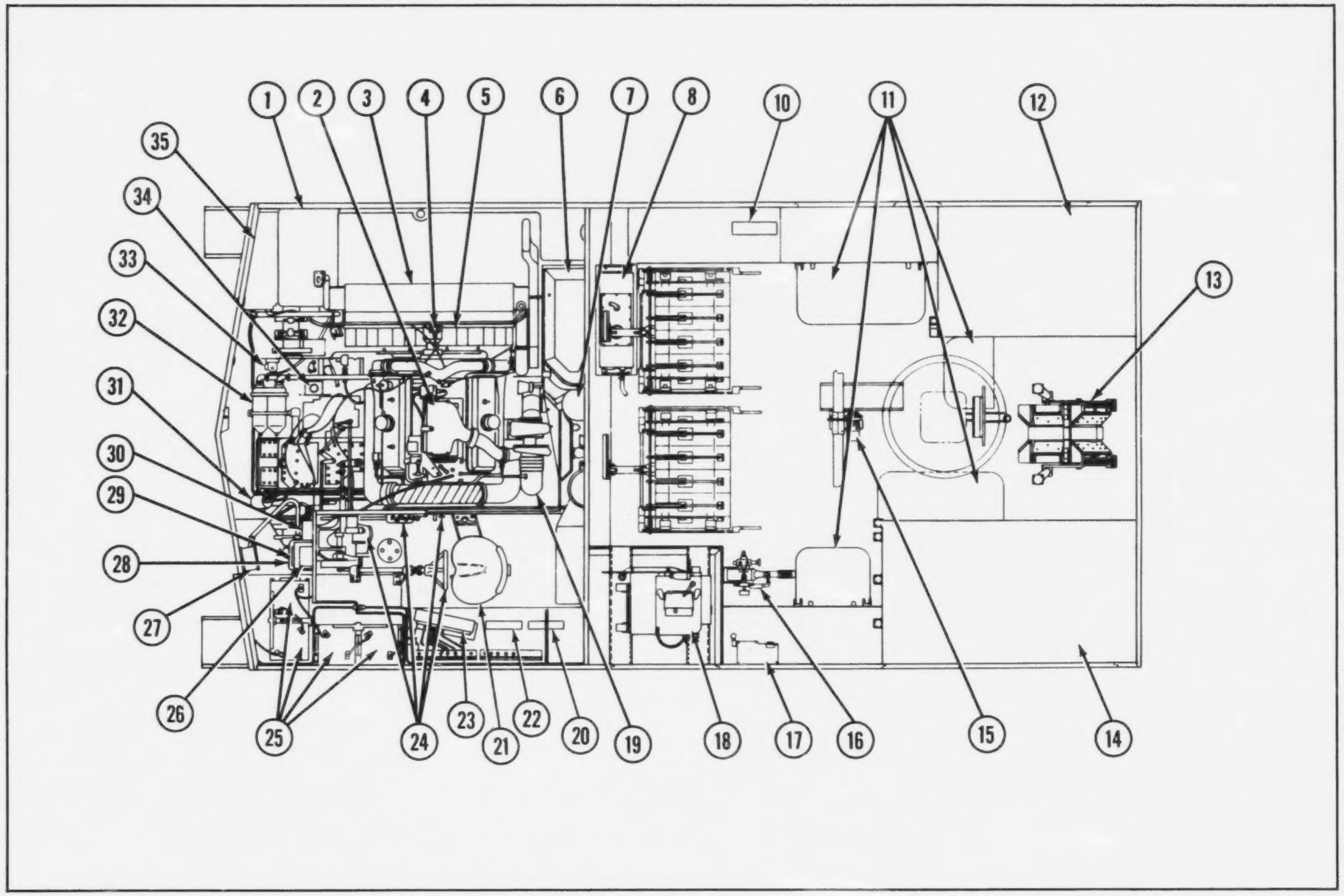


TOP VIEW

LEGEND

1 Air intake grille
2 Top doors
3 Commander's cupola
4 Crew AFES fire extinguisher box assembly
5 AFES Manual Discharge System; lanyard cable pull handle
6 Driver's hatch
7 Driver's periscope assembly
8 Battery access covers
9 Transmission access covers
10 Engine deck access plates

LOCATION OF VEHICLE COMPONENTS (VEHICLES 1 THRU 344 AND 345 AND ABOVE) - INTERIOR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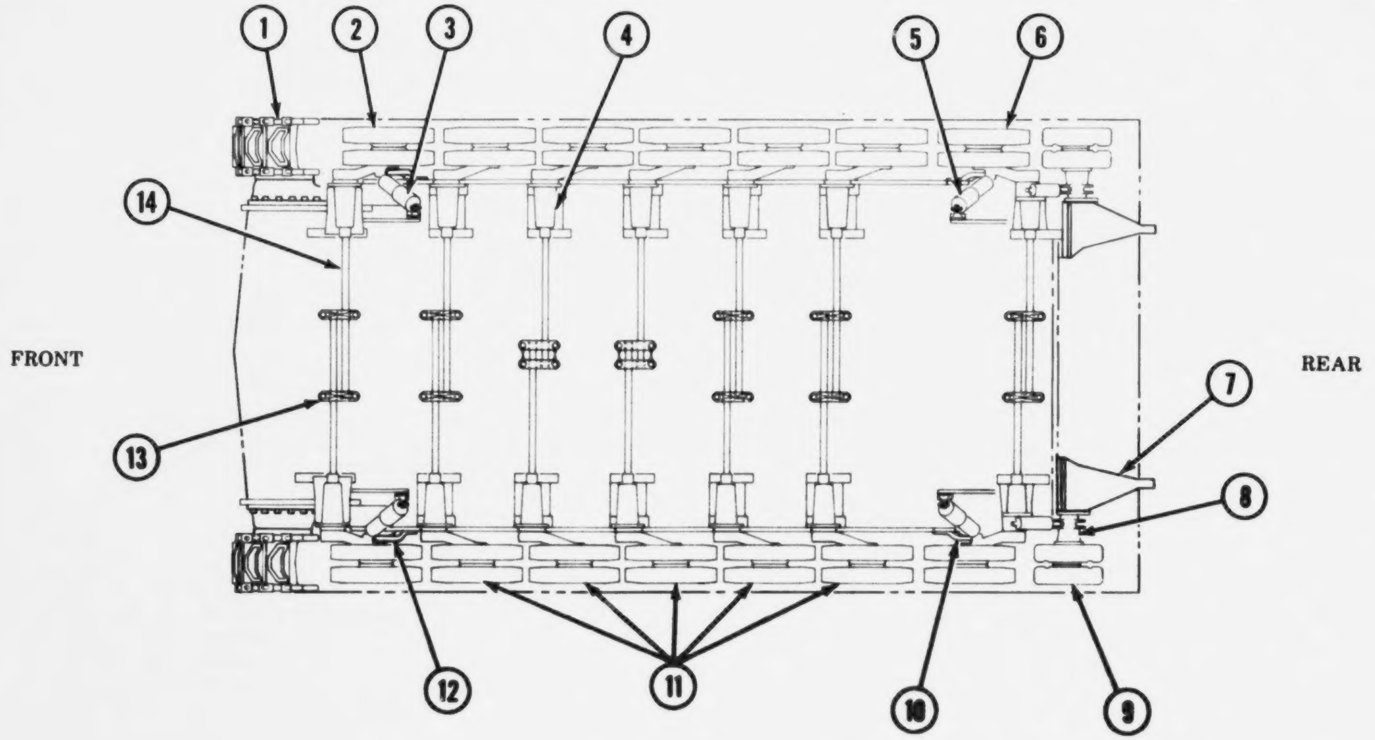
LOCATION OF VEHICLE COMPONENTS (VEHICLES 1 THRU 344 AND 345 AND ABOVE) - INTERIOR (CONTINUED)

LEGEND

1 Fuel tanks and pumps
2 Engine
3 Radiator
4 Generator (alternator)
5 Fan assembly
6 Air cleaner
7 Personnel heater
8 Hydraulic fluid tank
9 Projectile racks
10 Crew AFES test and alarm (T/A) panel
11 Crew seats
12 Canister racks (right)
13 Conveyor assembly
14 Canister racks (left)
15 Stacker
16 Hydraulic hand pump
17 Hydraulic control panel
18 Auxiliary power unit (APU)
19 Backup hydraulic pump
20 AFES manual discharge system actuator assembly
21 Driver's seat
22 Engine AFES test and alarm (T/A) panel
23 Instrument panels (fixed and portable)
24 Driver control
25 Batteries
26 Voltage regulator
27 Rectifier
28 Bilge pump relay
29 Starter relay
30 Master relay
31 Fuel filter (secondary)
32 Oil filters (engine)
33 Fuel filter (primary)
34 Transmission
35 Coolant surge tank

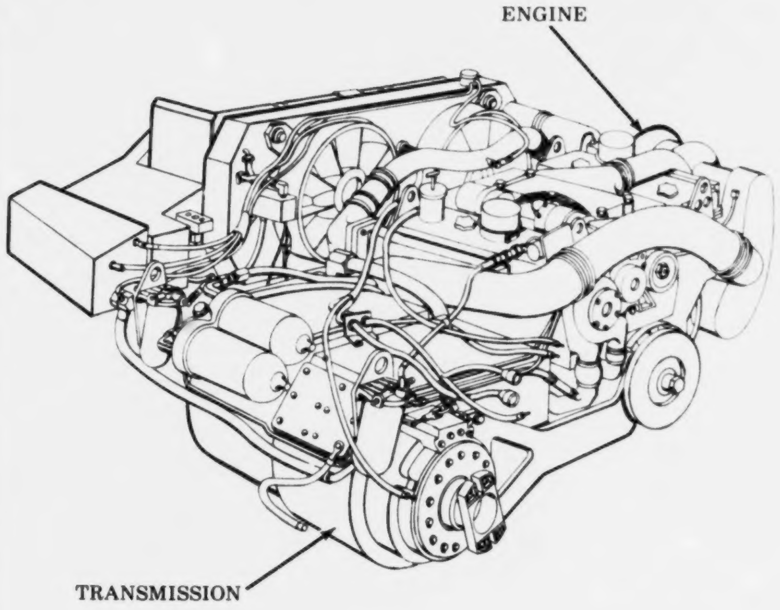
LOCATION OF SUSPENSION SYSTEM COMPONENTS AND FINAL DRIVE



LEGEND

1	Drive sprockets
2	Front roadwheels
3	Shock absorbers (front)
4	Roadwheel arms and hubs
5	Shock absorbers (rear)
6	Rear roadwheels
7	Idler wheel housings
8	Idler arms and hubs
9	Idler wheels
10	Bump stop brackets
11	Intermediate roadwheels
12	Bump stop brackets
13	Torsion bar anchors
14	Torsion bars

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS



POWERPACK

The powerpack includes the main diesel engine and unitized transmission and transfer assembly.

The transfer assembly transfers engine power to the transmission. The transmission transfers power through the final drive to the tracks.

The powerpack is removed and installed as a single unit and must be removed from the vehicle before the engine and transmission unit can be separated.

The engine is a Detroit Diesel, model 8V71T, turbocharged eight-cylinder, V-type, two-cycle diesel.

The Allison model XTG411-2A cross-drive transmission combines transmission, steering and braking. The driver's compartment steering wheel is connected through linkage to hydraulic controls in the transmission. Braking is controlled by the service brake pedal through linkage to disks in the transmission.

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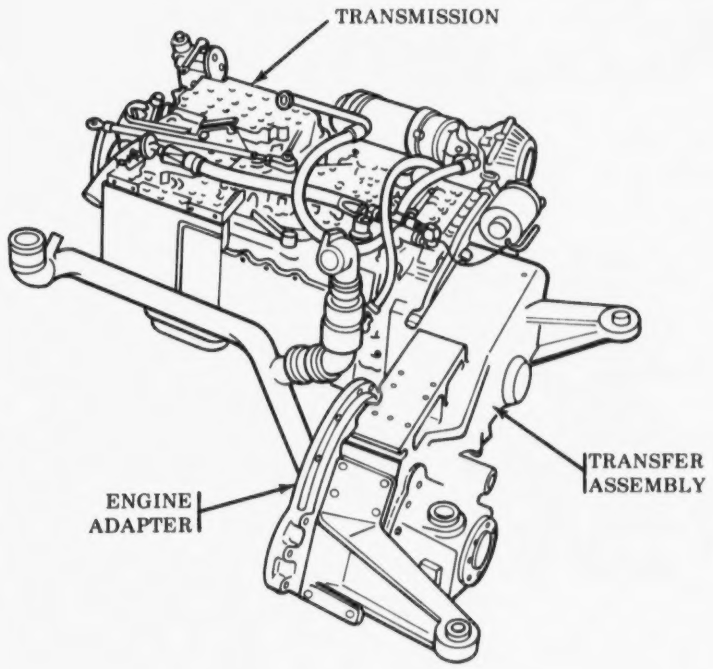
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)



TRANSMISSION ASSEMBLY AND DRIVE CONTROL ASSEMBLIES

The transmission is oil-cooled through the engine mounted oil cooler, and is mechanically and hydraulically operated. It receives power from the engine through a geared power transfer assembly. The transmission has four forward and two reverse speeds and one neutral setting. Power is delivered to the left and right final drives through output shafts linked by universal joints.

TRANSMISSION MECHANICALLY LINKED DRIVE CONTROL ASSEMBLIES INCLUDE:

BRAKES – Provide internal mechanical braking for right and left transmission drive assemblies. Used to stop or slow vehicle by depressing brake pedal in driver's compartment.

GEAR SHIFT SELECTOR – Selects speed for the transmission.

THROTTLE VALVE CONTROL – Transmission throttle valve control is interconnected with engine throttle and gear shift selector. With engine operating and shift control in neutral position, the transmission throttle valve is "locked out." When gear shift selector is in one of the drive gears (or reverse), transmission throttle valve is "locked in" allowing transfer of power from transfer assembly into transmission and to drive assembly.

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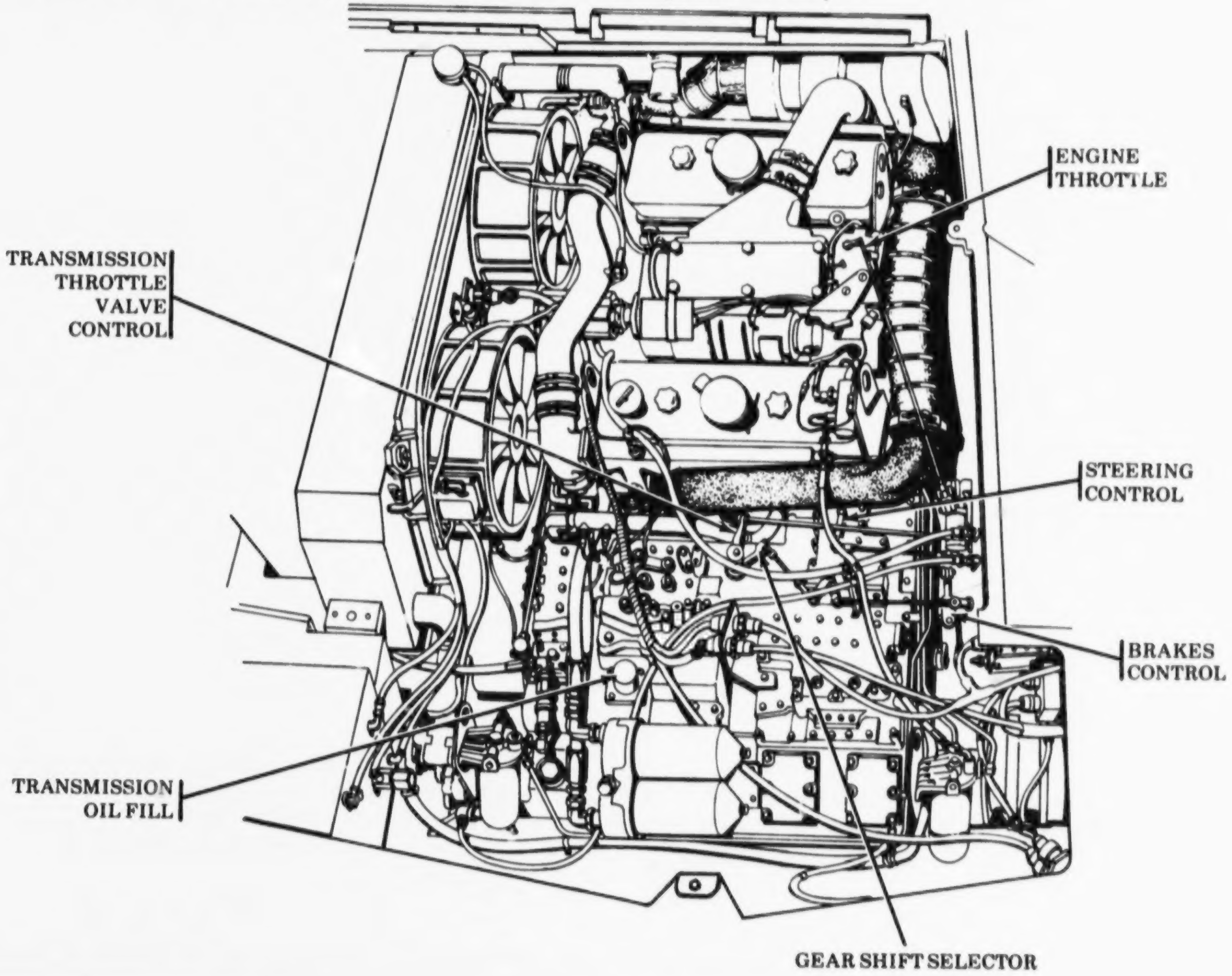
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

TRANSMISSION ASSEMBLY AND DRIVE CONTROL ASSEMBLIES (CONTINUED)


ENGINE THROTTLE
TRANSMISSION THROTTLE VALVE CONTROL
STEERING CONTROL
BRAKES CONTROL
TRANSMISSION OIL FILL
GEAR SHIFT SELECTOR

TA309927

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

TRANSMISSION ASSEMBLY AND DRIVE CONTROL ASSEMBLIES (CONTINUED)

NOTE

The transmission throttle valve control rod does not govern the speed of the vehicle or the transmission rpm. Speed and rpm are determined by engine rpm and the shift control position.

STEERING — Turning steering wheel in driver's compartment applies brakes to track on inside of turn. Left turn: brake is applied to left drive output. Right turn: brake is applied to right drive output.

TA309928

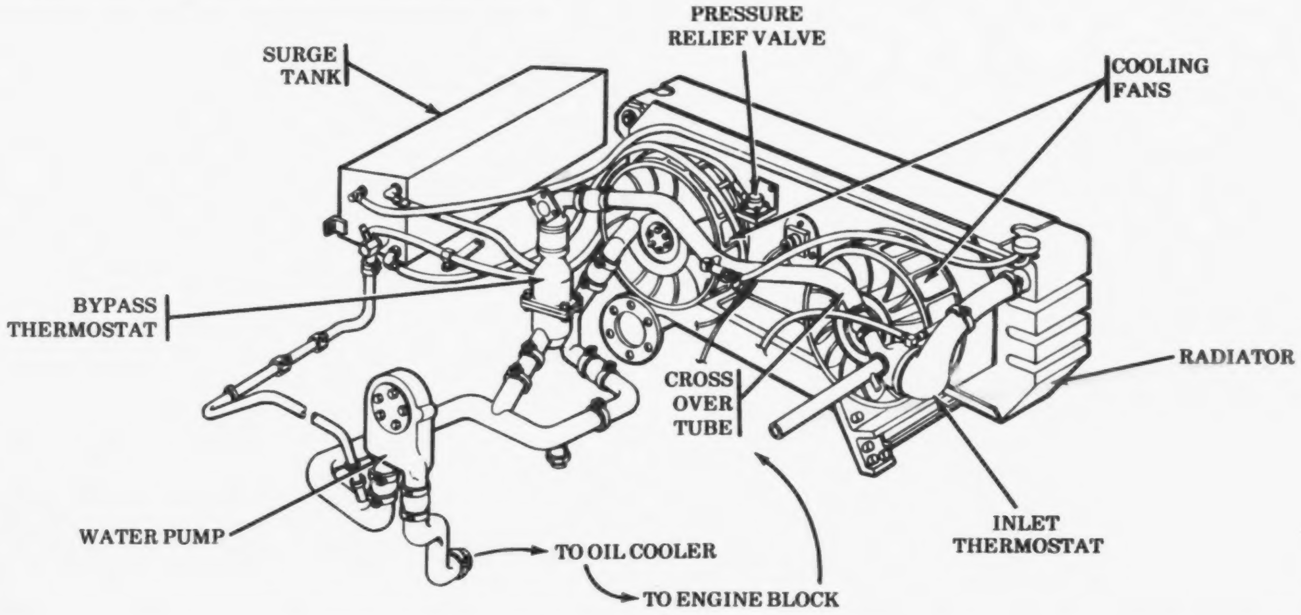
ENGINE COOLING SYSTEM

Cooling air is drawn through fan well cover and forced through radiator into engine compartment by two cooling fans. Air flows around engine and is exhausted through grilles on top of vehicle engine deck.

Engine coolant flows from coolant pump into two-section (engine/transmission) oil cooler mounted on engine. From oil cooler cores, coolant flow is directed into engine water jackets for engine block cooling. At normal operating temperatures the bypass thermostat is closed and inlet thermostat is open, allowing coolant to circulate through the radiator. Below normal operating temperatures, the inlet thermostat closes and the bypass thermostat opens allowing coolant to flow through cross-over tube, bypassing the radiator.

The surge tank collects and stores excess system coolant, allowing coolant to flow back into the system as required to maintain the system at full level. Air trapped in the system is bled to atmosphere through the pressure relief valve which is connected by hose to the surge tank.

The aeration detector senses low coolant level and activates a warning indicator light on the operator's instrument panel.


PRESSURE RELIEF VALVE
SURGE TANK
COOLING FANS
BYPASS THERMOSTAT
RADIATOR
CROSS OVER TUBE
INLET THERMOSTAT
WATER PUMP
TO OIL COOLER
TO ENGINE BLOCK

TA309929

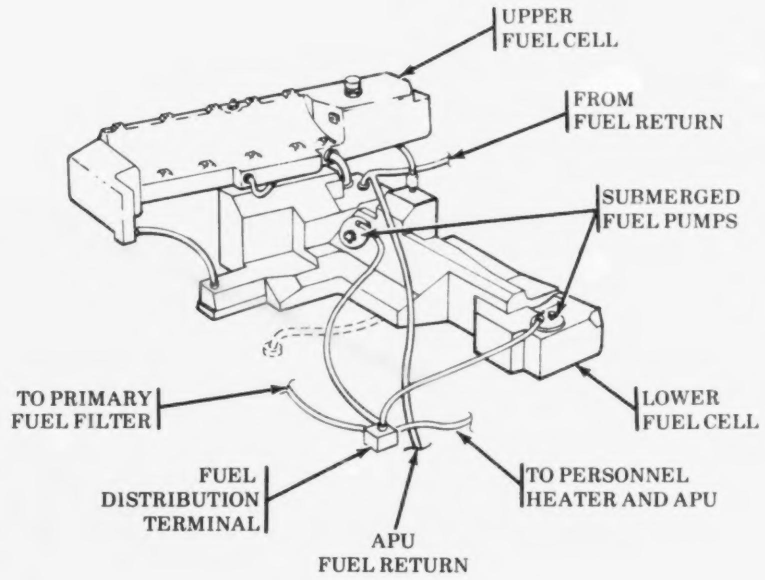
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

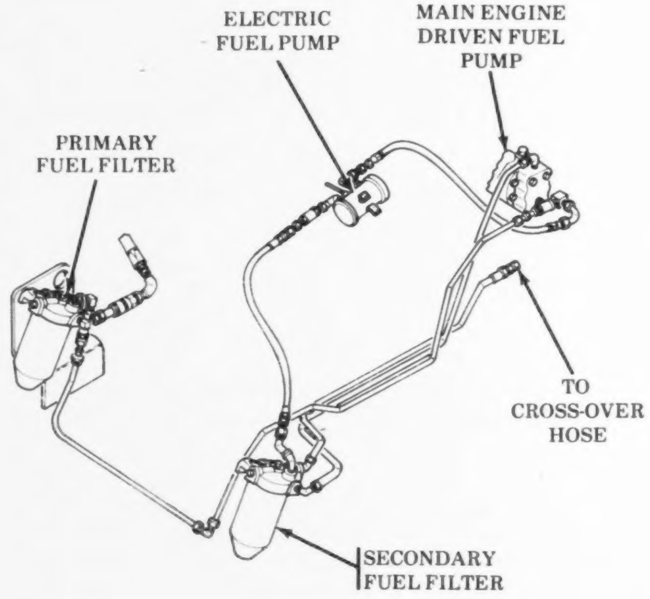
FUEL SYSTEM

The upper and lower fuel cells have a combined capacity of 135 gallons of fuel oil. Fuel oil is pumped from the cells, by two submerged electrically driven fuel pumps, to a fuel distribution terminal where it is routed to the personnel heater, APU fuel pump and filters, primary fuel filter or returned to the fuel cell.

The primary fuel filter receives fuel from the fuel cells. The main engine driven fuel pump pulls fuel from the primary fuel filter and channels it to the secondary fuel filter.

Fuel is delivered from the secondary fuel filter to the engine. The fuel return cross-over hose carries fuel from the right to the left cylinder head. Unused fuel from the engine is routed through the fuel return hose for delivery to the flame heater system, or returned to the fuel cells. The engine mounted electric fuel pump is activated by a switch on the driver's instrument panel, and allows flow of fuel from primary to secondary filters when the engine is not running.


UPPER FUEL CELL
FROM FUEL RETURN
SUBMERGED FUEL PUMPS
TO PRIMARY FUEL FILTER
LOWER FUEL CELL
FUEL DISTRIBUTION TERMINAL
TO PERSONNEL HEATER AND APU
APU FUEL RETURN


ELECTRIC FUEL PUMP
MAIN ENGINE DRIVEN FUEL PUMP
PRIMARY FUEL FILTER
TO CROSS-OVER HOSE
SECONDARY FUEL FILTER

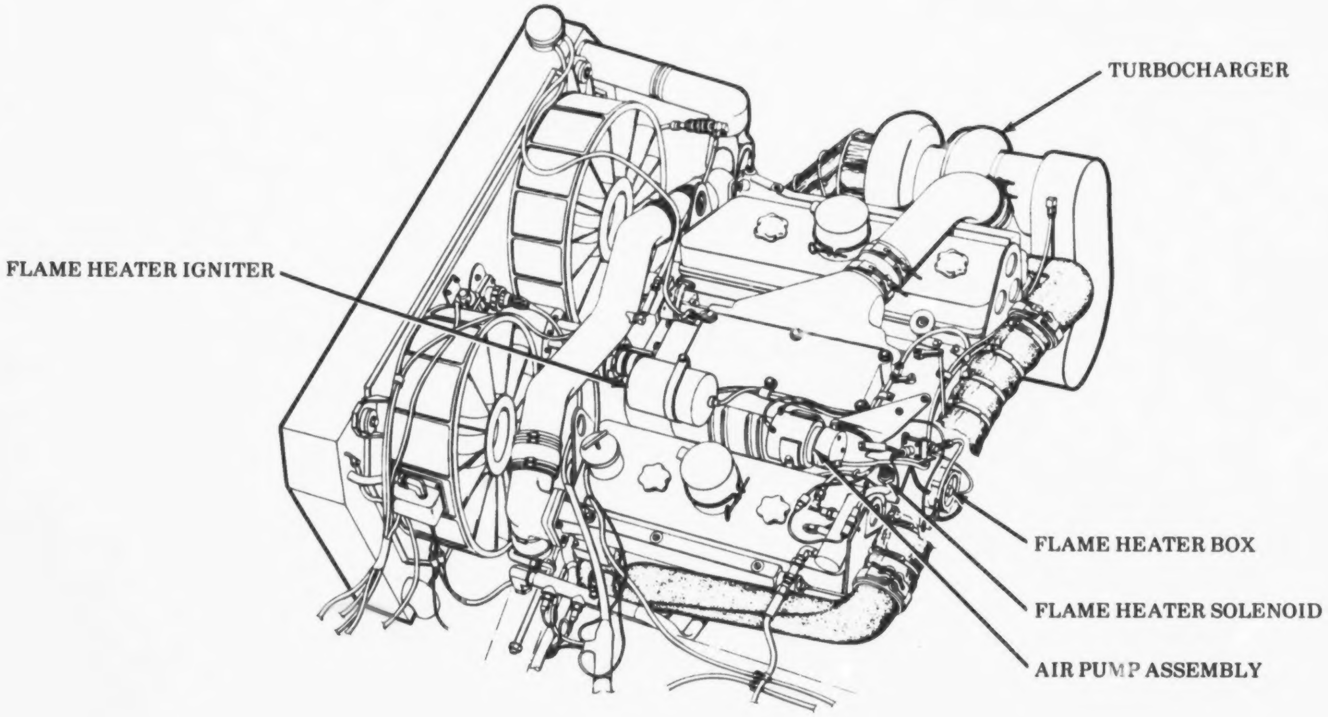
TA309930

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

FUEL SYSTEM (CONTINUED)

The flame heater assembly is used to bring the engine fuel combustion temperature up to operational level. The system is used during cold weather conditions or whenever the engine is hard to start. An ON/OFF switch on the driver's control panel actuates the system.

The flame heater solenoid opens to allow fuel from the fuel return system to be delivered to the flame heater box. The air pump assembly delivers air from the engine turbocharger to the flame heater box. There, the air/fuel mixture is atomized and electrically ignited by the flame heater igniter. The resulting preheated air mixture is then drawn into the cylinders for combustion.


TURBOCHARGER
FLAME HEATER IGNITER
FLAME HEATER BOX
FLAME HEATER SOLENOID
AIR PUMP ASSEMBLY

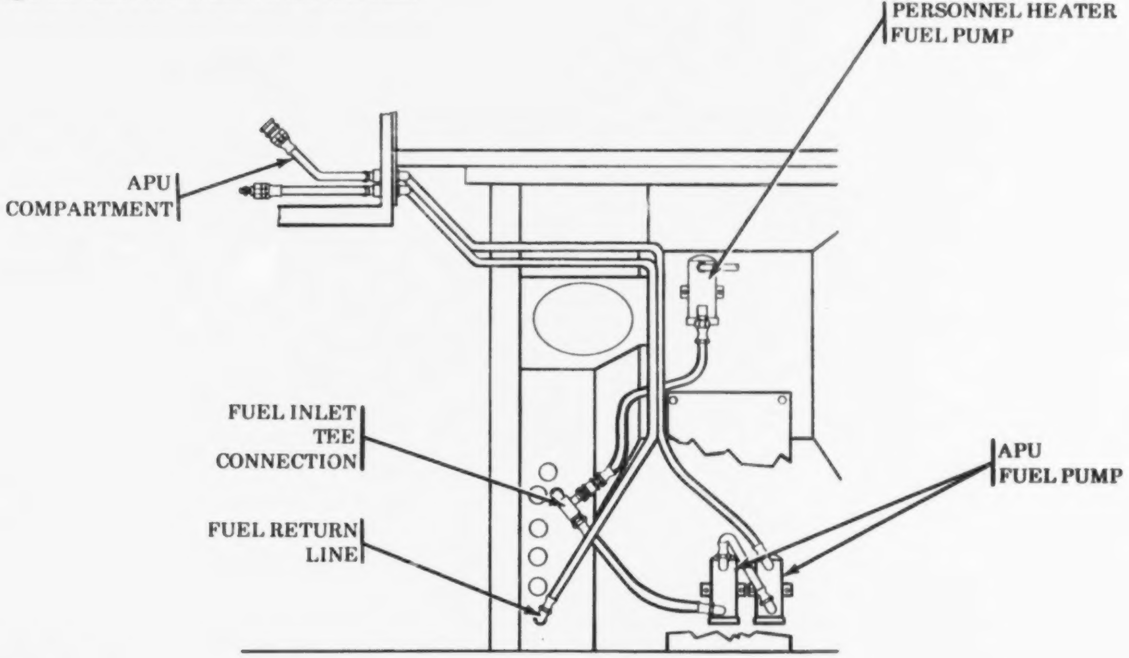
TA309931

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

FUEL SYSTEM (CONTINUED)

The Auxiliary Power Unit (APU) and personnel heater receive fuel through the fuel inlet tee connection from the fuel distribution terminal. APU pumps become operational when the MASTER switch located on the APU control panel is turned ON. Fuel is delivered to the APU compartment wall-mounted filters and on to the APU. Excess fuel is routed through the fuel return line to the fuel cells.

The personnel heater fuel pump becomes operational when the personnel heater MASTER switch is turned ON. Fuel is routed to the personnel heater filter and on to the heating unit.


PERSONNEL HEATER FUEL PUMP
APU COMPARTMENT
FUEL INLET TEE CONNECTION
FUEL RETURN LINE
APU FUEL PUMP

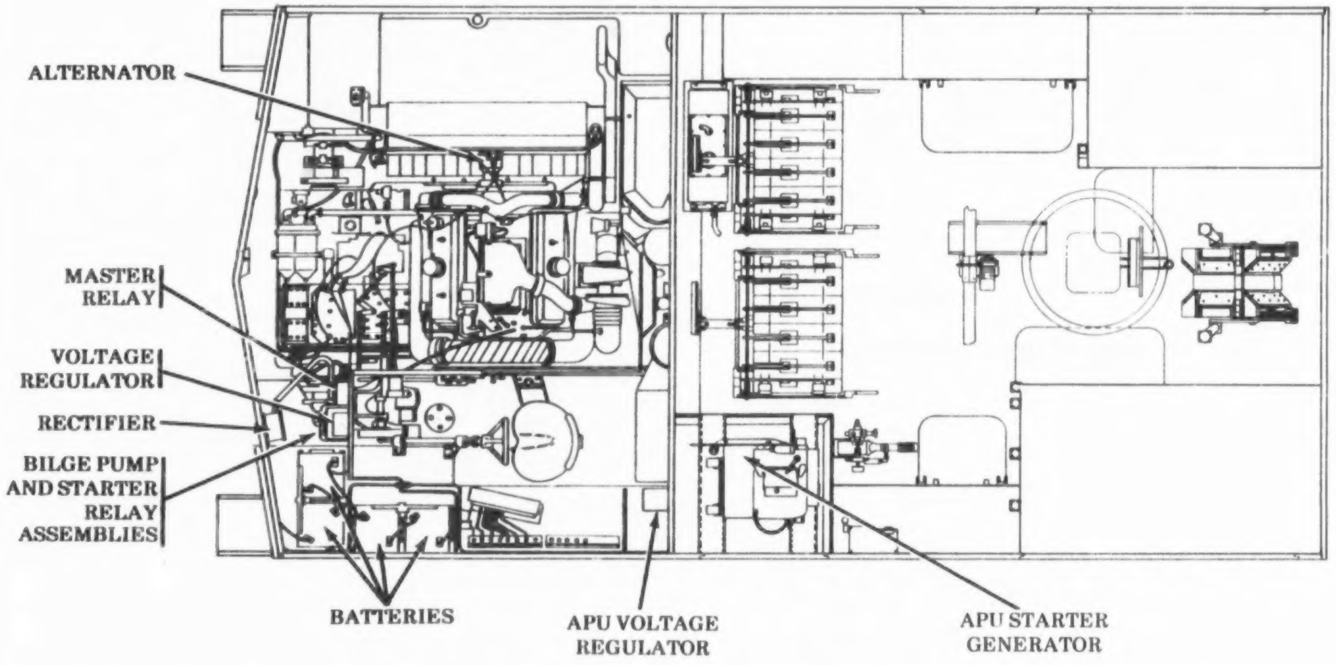
VIEW FROM INSIDE CREW COMPARTMENT

TA309932

ELECTRICAL SUPPLY SYSTEMS AND COMPONENTS

Four 12-volt batteries, connected in series and parallel, deliver 24 vdc to the master relay. The MASTER switch on the driver's control panel, when turned to ON position, draws 24 vdc from the batteries and will allow operation of the vehicle electrical systems without the main engine running. The engine driven alternator supplies 24 vac to the rectifier when the engine is operating. The rectifier converts the alternator ac voltage output to dc voltage, which in turn is supplied to the voltage regulator.

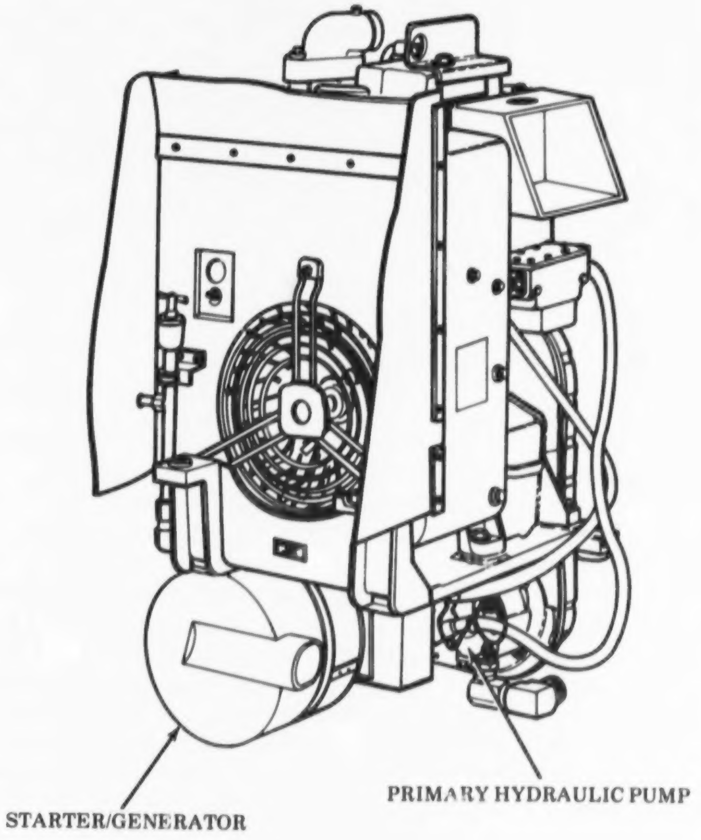
The voltage regulator controls the supply of 24 vdc to the vehicle electrical systems through the master relay. It also acts as a charger for the batteries when the engine is operating, keeping the batteries at full charge voltage. The APU electrical generator supplies 24 vdc through the APU voltage regulator to operate the vehicle electrical systems and to recharge the batteries when the vehicle main engine is not in operation.


ALTERNATOR
MASTER RELAY
VOLTAGE REGULATOR
RECTIFIER
BILGE PUMP AND STARTER RELAY ASSEMBLIES
BATTERIES
APU VOLTAGE REGULATOR
APU STARTER GENERATOR

TA309933

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

AUXILIARY POWER UNIT



AUXILIARY POWER UNIT (APU)

The Auxiliary Power Unit (APU) is an 11.5-horsepower, overhead-valve, two-cylinder, four-cycle, air-cooled, diesel engine used to drive an electrical generator and the primary hydraulic system pump.

The electrical generator is used to recharge the main engine batteries and provide electrical power for the operation of M992 components and the supported howitzer. It is coupled directly to the APU engine by a drive chain.

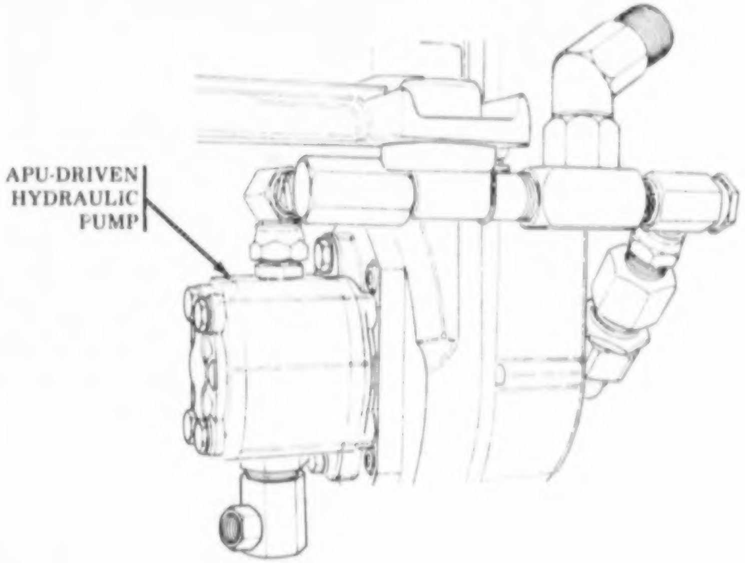
The primary hydraulic system pump provides power for hydraulic system component operation. Failure of the APU would result in primary system failure, making it necessary to operate the main engine backup hydraulic pump for system operation.

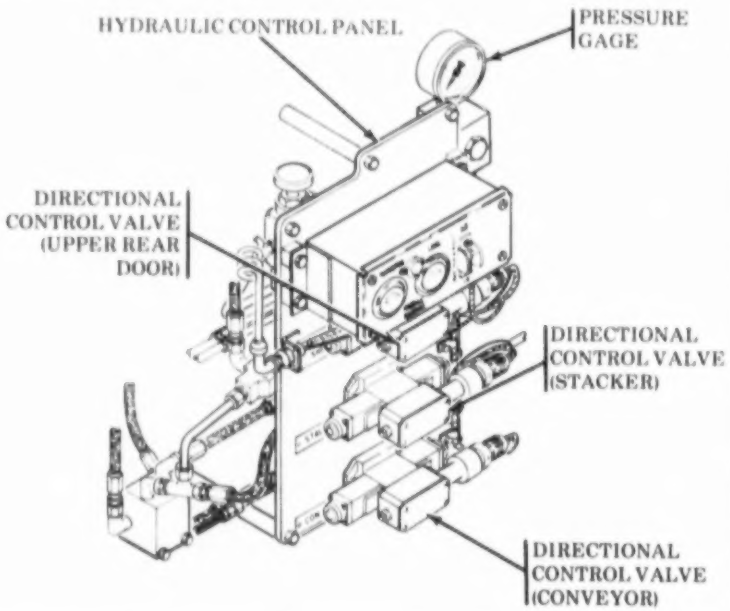
TA309934

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

HYDRAULIC SYSTEM (PRIMARY AND BACKUP)

The hydraulic system is used to operate the upper rear door, stacker and conveyor. The APU is used to drive the primary hydraulic pump for system operation. The primary hydraulic pump is capable of delivering 4.5 gallons per minute of flow at a system pressure of 1550 psi. Hydraulic fluid is pumped from the 13-gallon capacity hydraulic fluid reservoir to the hydraulic control panel. The hydraulic control panel assembly contains three electromechanically activated directional control valves used to route hydraulic fluid to the system to be operated. The upper directional control valve controls the action of the upper rear door actuator, extending or retracting the actuator to open or close the upper rear door. The center directional control valve controls the stacker tray up-and-down movement. The lower directional control valve controls the action of the conveyor motor for forward or reverse travel of the conveyor. The hydraulic control panel also incorporates a pressure gage which indicates primary or backup system pressure. The conveyor control switch actuates the conveyor solenoid at the conveyor control valve. The rear door switches are located at the upper and lower left areas of the rear door opening. The stacker tray control switch is located on the stacker. If there is a failure of the primary hydraulic system, the system can be operated by switching to the backup system.


APU-DRIVEN HYDRAULIC PUMP


HYDRAULIC CONTROL PANEL
PRESSURE GAGE
DIRECTIONAL CONTROL VALVE (UPPER REAR DOOR)
DIRECTIONAL CONTROL VALVE (STACKER)
DIRECTIONAL CONTROL VALVE (CONVEYOR)

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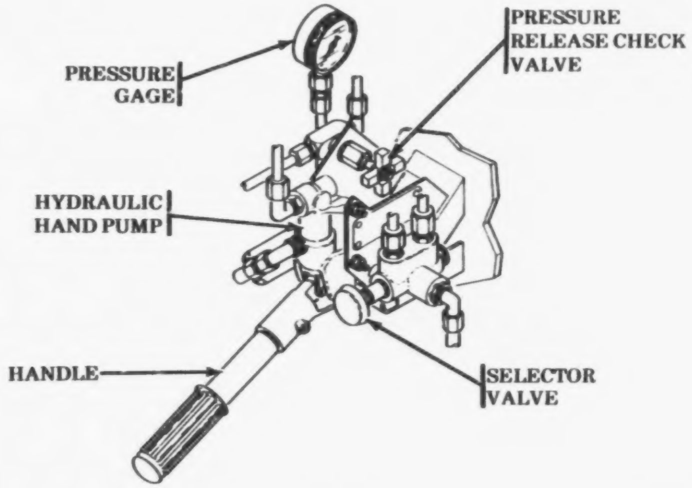
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

HYDRAULIC SYSTEM — PRIMARY AND BACKUP (CONTINUED)

CAUTION

Do not exceed 150 psi.

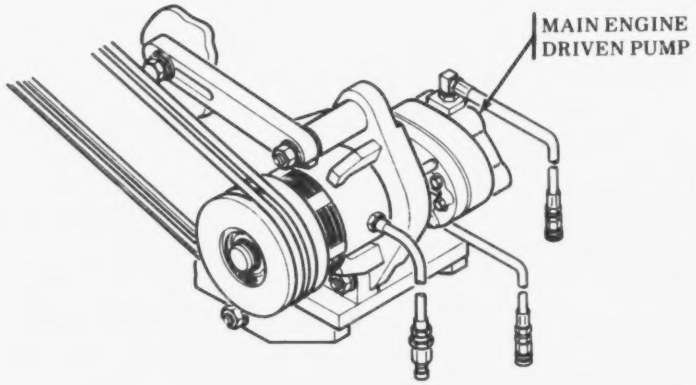
A hydraulic hand pump is used to activate the backup system. A selector valve, located next to the hand pump, is pushed/pulled to select the hydraulic pump source, either primary or backup. In the backup system mode, the pump handle is pumped several times until the pressure gage indicates 125 psi minimum to 150 psi maximum. This pressure, held by a check valve, engages the backup system clutch, which actuates the backup system belt-driven pump mounted on the main engine. The main engine-mounted hydraulic backup pump delivers 7.1 gallons per minute of flow at a system pressure of 1550 psi with the engine operating at 1100 rpm.



CAUTION

Operation of the backup hydraulic system at engine speeds greater than 1100 rpm for more than a few minutes will overheat the hydraulic fluid and may cause system malfunction.

To disengage the backup hydraulic system pump, open the pressure release check valve to release hydraulic fluid pressure and push selector valve IN.



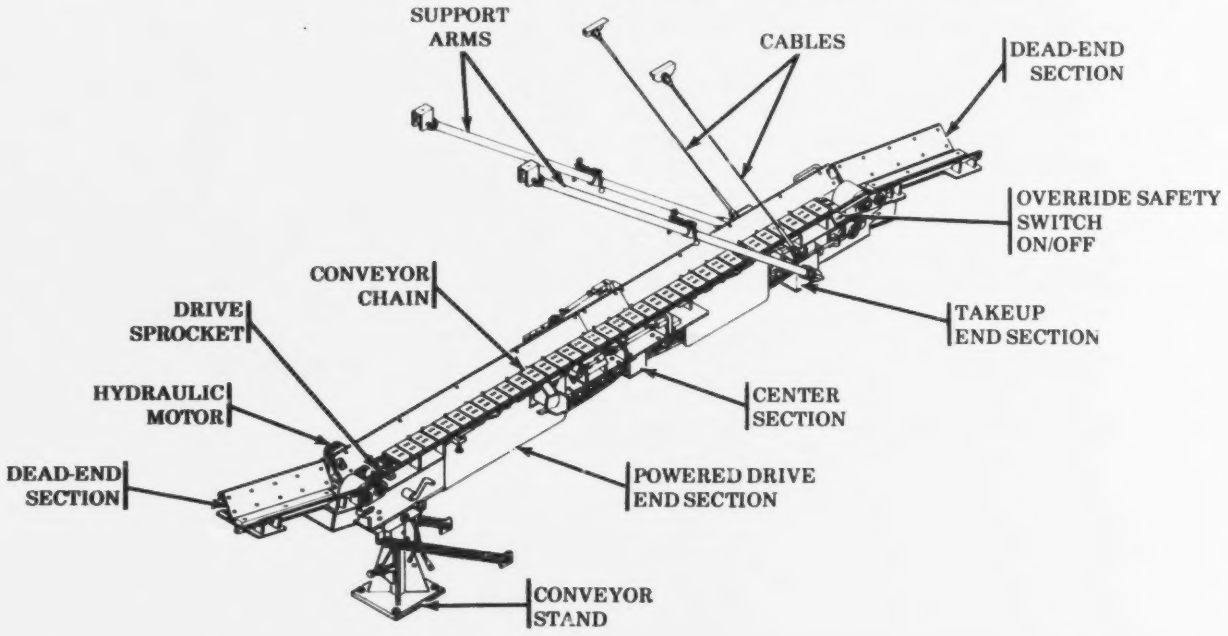
TA309936

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)

CONVEYOR SYSTEM

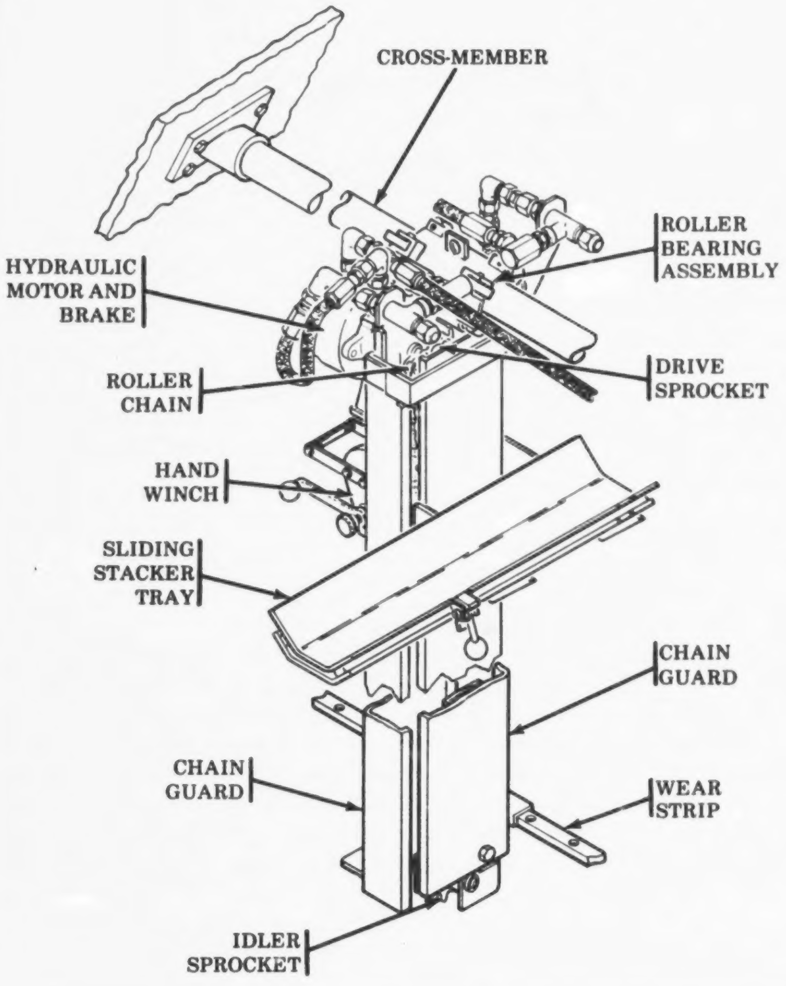
The conveyor is a hydraulically powered system and can be operated in either forward or reverse direction. Two stationary dead-end sections, one at each end, are used as staging areas for ammunition transfer. The powered parts of the conveyor are: powered drive end section, center section and takeup end section. A three-position switch, located on the hydraulic control panel, actuates the conveyor directional control valve which allows the conveyor motor to operate in either forward or reverse. A drive sprocket coupled to the motor shaft moves the conveyor chain.

An override safety (ON/OFF) switch, located at the takeup end section, provides an outside vehicle shutoff capability. The chain runs taut across the top of the conveyor, and loose across the bottom. A chain adjustment device allows chain tension to be adjusted by moving the idler sprocket forward or backward. Telescoping support arms serve to adjust and lock the conveyor in several operating positions. Two cable assemblies support the conveyor when deploying the system, and are removed and stowed when the system is in operation. A hand crank, for manual operation, is provided in case of a malfunction of the hydraulic system. The conveyor can be folded and stowed inside the vehicle when not in use.


SUPPORT ARMS
CABLES
DEAD-END SECTION
OVERRIDE SAFETY SWITCH ON/OFF
CONVEYOR CHAIN
DRIVE SPROCKET
TAKEUP END SECTION
HYDRAULIC MOTOR
CENTER SECTION
DEAD-END SECTION
POWERED DRIVE END SECTION
CONVEYOR STAND

TA309937

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)


CROSS-MEMBER
HYDRAULIC MOTOR AND BRAKE
ROLLER BEARING ASSEMBLY
ROLLER CHAIN
DRIVE SPROCKET
HAND WINCH
SLIDING STACKER TRAY
CHAIN GUARD
CHAIN GUARD
WEAR STRIP
IDLER SPROCKET

STACKER SYSTEM

The stacker is used to transfer projectiles between the conveyor and projectile racks.

Vertical Motion:

The sliding stacker projectile tray is connected to a roller chain that travels between the upper drive sprocket and lower idler sprocket. The drive sprocket is shaft-mounted to the hydraulic motor. Up-and-down movement is controlled by two pushbutton switches mounted on the upper back of the chain guard. The pushbuttons actuate the stacker directional control valve which allows hydraulic fluid to the motor. The projectile tray is prevented from falling by a hydraulic brake mounted on the motor.

A winch assembly provides manual operation of the projectile tray when hydraulic power is unavailable.

Horizontal Motion:

Movement of the stacker from one side of the cargo compartment to the other is accomplished by pushing the stacker manually. The stacker is supported at the top by a horizontal cross-member, and is guided along the vehicle floor by a wear strip. The roller bearing assembly, mounted to the vertical support assembly, provides ease of horizontal travel.

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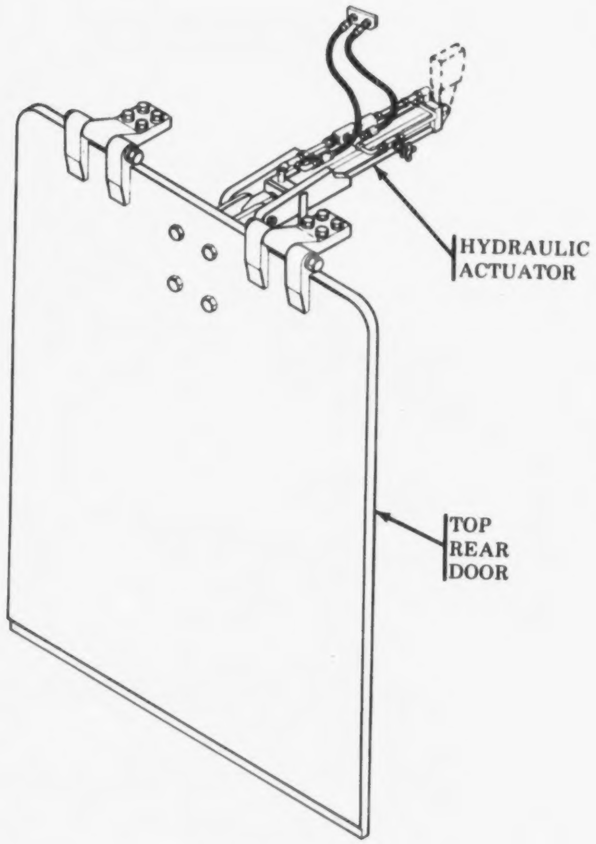


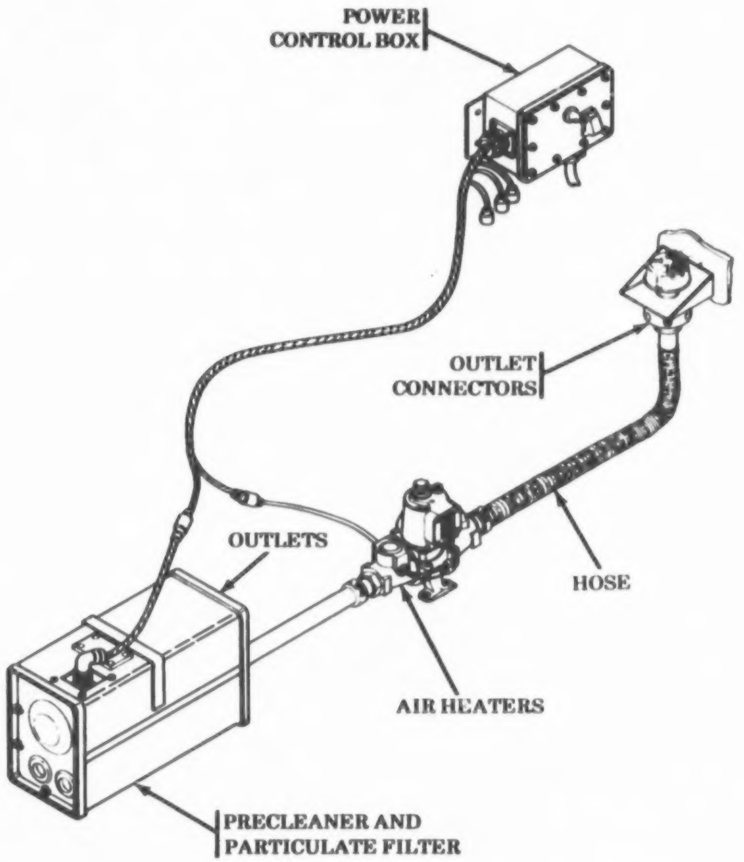
TOP REAR DOOR

The top rear door is hydraulically actuated. In the raised position, it forms an overhead ballistic shield, providing protection between the M992 and the supported howitzer. The door is also used to deploy and position the conveyor. From the closed position, it can be raised to any position through 120 degrees. The top rear door directional control valve can be actuated by two three-position switches mounted inside the rear door opening on the left side. One is mounted high, the other low, for inside and outside access.

In the event of hydraulic power loss, the door is prevented from closing by a pilot check valve which stops hydraulic fluid backflow within the door hydraulic system. In addition, a mechanical lock engages the vehicle hull in the 45- and 90-degree positions.

TA309939

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)



NBC VENTILATED FACE PIECE SYSTEM

The ventilated face piece system provides clean, filtered air for the crew and personnel under NBC situations.

The system is comprised of one air precleaner/particulate filter unit with four outlets, four M3 air heaters, four outlet connectors and one NBC power control box.

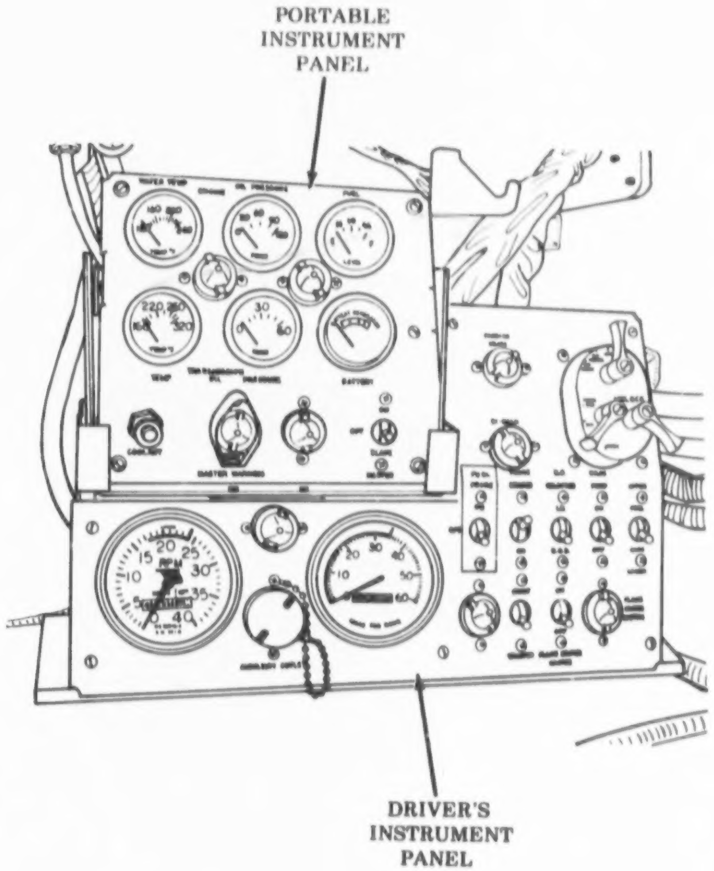
The air precleaner/particulate filter is located in the lower left rear of the crew compartment. The air heaters are mounted forward from the precleaner. The NBC power control box is attached to the vehicle ceiling in the crew compartment on the left side.

When not in use, hoses are connected to outlet connectors which function as one-way valves allowing system air to escape, and preventing contaminated air from entering through backflow. When in use, outlet connecting hoses are disconnected from outlet connectors and inserted in the canister packs of the face masks used with the system.

Each of the four filtered air outlets has an M3 air heater connected in line to allow air temperature to be individually controlled by the user.

TA309940

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)



DRIVER'S INSTRUMENT PANELS

The driver's instrument panel is located to the left and in front of the driver's seat. The panel has a portable instrument panel that can be separated from the driver's instrument panel chassis and placed on the hull, outside the vehicle, for hatch-open operation. The portable panel contains the following:

MASTER SWITCH - Actuates entire electrical system.

MASTER WARNING LIGHT - Indicates critical powerpack operating conditions for:

Transmission oil low pressure
Transmission oil high temperature
Engine coolant high temperature
Engine oil low temperature

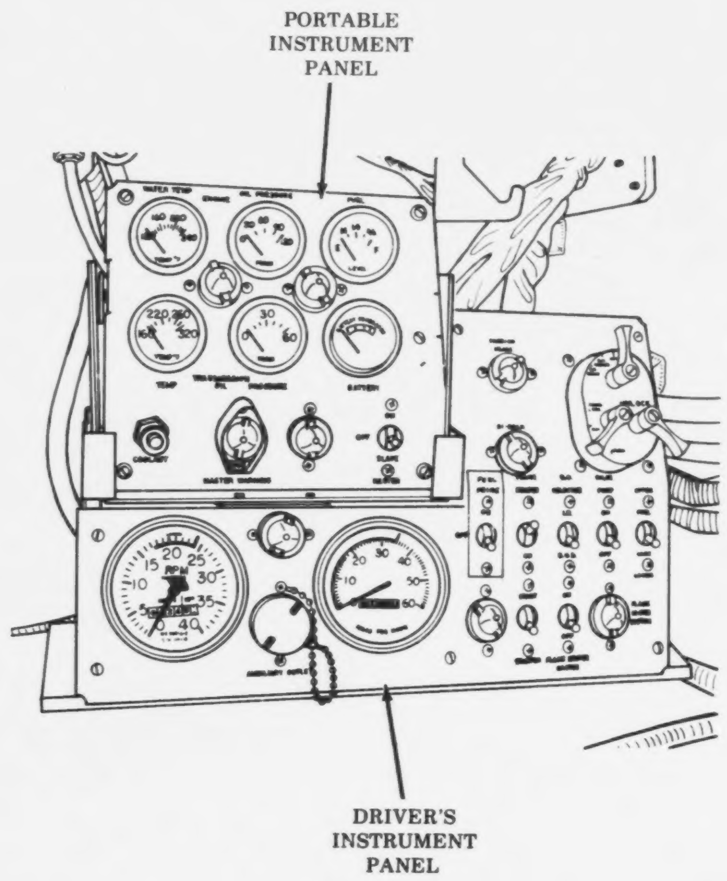
COOLANT LIGHT - Indicates low coolant (water) level.

GAGES - Indicating the following:

Engine coolant (water) temperature
Engine oil pressure
Fuel level
Transmission oil temperature
Transmission oil pressure
Battery generator condition

TA309941

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS AND SYSTEMS (CONTINUED)



DRIVER'S INSTRUMENT PANELS (CONTINUED)

The driver's instrument panel contains the following:

SWITCHES:

FUEL PRIME switch ON/OFF
FLAME HEATER switch
FLAME HEATER MASTER switch
Infrared (IR) and blackout (BO) SELECTOR switch
Light switch unit (controls driving lights and switch panel lights)
BILGE PUMP switch ON/OFF
Fuel level gage transmitter switch, UPPER/LOWER
STARTER switch

INDICATOR LAMPS:

Fuel prime ON indicator lamp
Flame heater system indicator lamp
Headlights high beam indicator lamp
Parking brake engaged indicator lamp
Switch panel lamp

GAGES — Switch:

Speedometer/odometer (vehicle speed/mileage)
Tachometer/hour meter (engine rpm/engine use time)
Auxiliary outlet

TA309942

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VEHICLE SPECIFICATIONS

GENERAL

Crew	3
Other personnel	5 max
Weight (combat loaded)	57,125 lb
Length (overall)	267 in.
Width (overall)	124 in.
Height (overall, combat loaded to top of machine gun mount)	126 in.
Ground clearance	17-11/16 in.
Armament	.50-cal, M2, HB flex machine gun; 5.56mm, M16A, rifle

PERFORMANCE

High speed (max)	35 mph
Reverse speed (max)	7 mph
Maximum grade	60 percent
Maximum trench (width)	72 in.
Maximum vertical wall	21 in.
Turning radius (min)	1 vehicle length
Fording depth	42 in.
Cruising range	220 miles

ENGINE

Type/model	Detroit Diesel 8V71T, liquid-cooled, two-cycle
Manufacturer	Detroit Diesel, Allison Div., GMC
Cylinders	8
Horsepower (gross)	405 at 2350 rpm
Horsepower (net)	345 at 2300 rpm
Displacement	567.4 cu in.
Bore	4.25 in.
Stroke	5 in.
Compression ratio	17:1
Torque (max gross)	980 lb-ft at 1700 rpm
Torque (max net)	895 lb-ft at 1600 rpm
Ignition	Compression
Fuel oil	
Regular grade (DF-2) (NATO F-54)	+20° to 115°F
Winter grade (DF-1)	−20° to +20°F
Arctic grade (DF-A)	−65° to −25°F

NOTE

Under emergency conditions and in military operations involving jet transportation, JP-5 aircraft turbine engine fuel may be used instead of VV-F-800.

Fuel capacity	135 gal
Fuel acceptance (safe max)	50 gpm
Lubrication oil system capacity (refill)	27 qt (approx)
Cooling system capacity (refill)	14.5 gal
Cooling system capacity (dry)	25.20 gal

TRANSMISSION

Model	XTG411-2A
Manufacturer	Allison Div., GMC
Usable ranges:	
First (low range)	5.69:1
Second (low intermediate)	3.17:1
Third (low intermediate)	1.58:1
Fourth (high range)	0.79:1
Low reverse (R-1)	5.60:1
High reverse (R-2)	3.79:1
Steer	1.475:1
Oil capacity (refill)	56 qt
Steer control (first and second)	Clutch brake

VEHICLE SPECIFICATIONS (CONTINUED)

TRANSMISSION (CONTINUED)

Steer control (third and fourth)	Geared
Brakes	Mechanical - applied
Oil capacity (refill)	14 gal
Oil capacity (dry)	21 gal

ELECTRICAL SYSTEM

Voltage (nominal)	24 vdc
Batteries	four, 12 vdc each, series-parallel
Generator (alternator) type	GTN
Manufacturer	Leece-Neville
Model	A001-5504AC
Type	Three-phase
Amperage	100
RPM	2000-2800
Watts	2800
Voltage	28 vdc

COMMUNICATIONS

Intercommunication set (model)	AN/VIC-1
Outlets	3
External jacks	1
External extension (model)	C-988/U

SUSPENSION

Type	Independent torsion bar
Roadwheel	7 sets
Size	24 in.
Loadings:	
1, 2 and 7 positions	4000 lb (approx)
Intermediate positions	2600 lb (approx)

Track:	
Adjustment at idler wheel	Track adjuster
Shoes per track	80
Pitch	6 in.
Width	15 in.

FINAL DRIVES AND SPROCKETS

Type	Spur gear
Ratio	4.36:1
Sprocket pitch diameter	19.5 in.
Number teeth per sprocket	10

AUTOMATIC FIRE EXTINGUISHING SYSTEM (AFES)

Manufacturer	HTL Systems
Extinguishing agent	Halon 1301
Systems:	
Quantity	3
Type	Engine AFES,Crew AFES, AFES Manual Discharge System
Bottles (fixed) (Vehicles 1 thru 344):	
Number	Engine AFES - 2, Crew AFES - 4
Capacity (ea)	10 lb, Halon 1301
Pressure	750 psig, Nitrogen at 70°F
Bottles (fixed) (Vehicles 345 and above):	
Number	Engine AFES - 2, Crew AFES - 6
Capacity (ea)	Engine AFES - Two 10 lb, Halon 1301 Crew AFES - Six 7 lb, Halon 1301
Pressure	750 psig, Nitrogen at 70°F
Halon Distribution	Engine and crew compartments
Detection system (hydrocarbon fires):	
Engine AFES	Engine compartment thermal wire

VEHICLE SPECIFICATIONS (CONTINUED)

AUTOMATIC FIRE EXTINGUISHING SYSTEM (AFES) (CONTINUED)

Crew AFES	Four crew compartment optical fire detecting assemblies
Discharge System	Automatic (engine AFES and crew AFES) and Manual (AFES/MDS and MANUAL switch on engine AFES and crew AFES T/A panel)
Detection/suppress time	250 ms
Portable extinguishers:	
Manufacturer	Metalcraft, Inc.
Bottles	2
Type	CF^3
Capacity	2.75 lb
Extinguishing agent	CF^3
Discharge System	Manual

HYDRAULIC SYSTEM

Reservoir capacity	13 gal
Primary pump (APU-driven):	
Manufacturer	Rexroth Corp.
Model	P2-3AH2-1L
Flow rate	6.9 gpm at 2000 rpm
Type	Gear
Backup pump (engine-drive):	
Manufacturer	Parker Hannifin Corp.
Model	4-62-AA-1-B
Flow rate	7.1 gpm at 1157 rpm, engine speed 1100 rpm
Type	Gear
Hydraulic clutch	
Manufacturer	Carlyle Johnson Machine Co.
Model	A-H50A
System pressure	1550 psi
Oil	MIL-H-6083
Temperature	-65° to +129°F
Filter	10-micron element
Hydraulic hand pump	
Manufacturer	Teledyne Republic
Model	404210

CONVEYOR

Hydraulic Motor	
Manufacturer	H.P.I. Nichols
Model	110-3-450
Type	Gear
Chain	
Length	19 ft

STACKER

Hydraulic Motor	
Manufacturer	Char-Lyn
Model	101-1011
Type	Gear
Hydraulic Brake	
Manufacturer	Ausco
Model	35385
Roller chain length	13 ft

AUXILIARY POWER UNIT (APU)

Manufacturer	ONAN
Model	DJEAM
Type	Four-cycle diesel

VEHICLE SPECIFICATIONS (CONTINUED)

Number of cylinders	2
Displacement	70 cu in.
Horsepower at 2000 rpm (500 ft elevation - 125°F, ambient	11.5 hp
Governor setting	2000 rpm ± 100
Bore	3.50 in. dia
Stroke	3.625 in.
Compression ratio	19:1
Oil capacity, including 1/2 qt for filter	3.5 qt
Operating temperature (ambient)	125°F max
Fuel	See Main Engine Fuel Specifications
Cooling air at 2000 rpm, cu ft/min	650 cu ft/min
Combustion air at 2000 rpm	34.0 cu ft/min

APU ELECTRICAL DATA

Generator/starter (combination)	
Manufacturer	Minowitz Mfg. Co.
Output	24 vdc (nominal)
Battery voltage requirements	24-volt system
Glow plug	2
Manifold heater, series connected	2

CHAPTER 2
GENERAL MAINTENANCE PROCEDURES

CHAPTER OVERVIEW

The objective of this chapter is to accurately present to the mechanic detailed instructions and additional information required to maintain the M992 vehicle equipment and components in good repair. These detailed instructions provide a step-by-step and item-by-item illustrated text describing M992 equipment and component service and maintenance.

The maintenance functions described in this chapter are limited to those authorized by the MAC for organizational maintenance level activities. If maintenance is required on equipment or components not discussed in this chapter, notify Direct Support Maintenance for assistance.

Section I Repair Parts, Special Tools, TMDE and Support Equipment

Section II Service Upon Receipt

Section III Preventive Maintenance Checks and Services (PMCS)

Section IV STE/ICE Troubleshooting

Section V Troubleshooting

Section VI Wiring Harness and Cable Repairs

Section I REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE) AND SUPPORT EQUIPMENT

GENERAL

Tools, equipment and repair parts are issued to organizational maintenance personnel for maintaining vehicle equipment. Special tools and equipment should not be used for purposes other than those prescribed and, when not in use, should be properly stowed.

SPARES AND REPAIR PARTS

Vehicle spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-267-20P.

COMMON TOOLS AND EQUIPMENT

Standard and commonly used tools and equipment having general application to vehicle components are authorized for use by Tables of Allowance (TA) and Tables of Organization and Equipment (TOE).

SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Tools and equipment specially designed for organizational maintenance use are listed in Appendix B for information only and are not to be used for requisitioning parts.

Section II SERVICE UPON RECEIPT

GENERAL

A Follow all precautions on DD Form 1397 (Processing and Deprocessing Record for Shipment, Storage and Issue of Vehicles and Spare Engines).

B If the vehicle has been shipped by rail, unblock and unload the equipment, using the instructions in Chapters 17 and 18 as a guide. Observe existing regulations.

C Conduct a run-in of at least 5 miles on all new or reconditioned vehicles. Operate used vehicles enough to completely check proper operation.

WARNING

DO NOT USE MINERAL SPIRITS OR PAINT THINNER TO CLEAN THE M992.

Mineral spirits and paint thinners are highly toxic and combustible. Prolonged breathing can cause dizziness, nausea and even death. DO NOT USE THESE MATERIALS.

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

D Interior and exterior parts should be coated with rust-preventive compound when received from storage. They should be thoroughly cleaned with rags or a brush saturated with dry-cleaning solvent (item 19, Appx D). After complete removal of the compound, lubricate if specified in LO 9-2350-267-12. Component parts of each weapon should be cleaned separately where possible. Although like parts are interchangeable, the parts originally assembled work best together.

SPECIFIC PROCEDURES

A To make the M992 Automatic Fire Extinguishing System (AFES) operational, perform the following procedures in the sequence listed. AFES consists of three individual systems: Engine AFES, Crew AFES and AFES Manual Discharge System. Each must be serviced upon receipt as follows:

WARNING

Use caution when working near fire extinguisher nozzles. When nozzles discharge, frostbite may occur to personnel, and small objects may become projectiles causing SERIOUS INJURY or damage. Do not strike extinguisher with tools.

(1) Move projectile racks to rear of vehicle (TM 9-2350-267-10).

(2) Turn MASTER switch ON.

(3) Engine AFES

WARNING

AFES is designed to provide 2 to 4 hours of fire protection AFTER vehicle shutdown. Turning MASTER switch OFF does not deactivate AFES. Working on AFES when active may cause SERIOUS INJURY to personnel.

a Turn MAINTenance switch on engine T/A panel (1) (p 14-14.3) to vertical position. Make sure all lamps including POWER ON lamp on T/A panel, are not lit.

b Check that seven connector backshells on wiring harness 12351500 of vehicles 1 thru 344 (p 14-50.5) or wiring harness 12352354 of vehicles 345 and above (p 14-52.12) are secure. If not secure, loosen connector backshells, apply sealing compound (NSN 8030-00-163-5792), and retighten.

c Check that engine compartment fire sensing wire is secure and connections are tight.

d Make sure locking pin (5) (p 14-14.4) is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 (1) (p 14-28.1 for vehicles 1 thru 344) and (1) (p 14-28.7 for vehicles 345 and above).

e Turn MAINTenance switch on engine T/A panel (1) (p 14-14.3) to horizontal position. Make sure green POWER ON lamp lights and green PASS TEST lamp lights and then goes out indicating that system is operational.

f Set SYSTEM TEST/LAMP TEST switch on engine T/A panel to LAMP TEST position. Verify that all four lamps and four light-emitting diodes (LED's) light. Time permitting, perform engine AFES system test (vehicles 1 thru 344 p 14-59 or vehicles 345 and above p 14-50.5).

(4) Crew AFES

WARNING

AFES is designed to provide 2 to 4 hours of fire protection AFTER vehicle shutdown. Turning MASTER switch OFF does not deactivate AFES. Working on AFES when active may cause SERIOUS INJURY to personnel.

a Turn MAINTenance switch on crew T/A panel (1) (p 14-14.7) to vertical position. Make sure all lamps, including POWER ON lamp on crew T/A panel, go off.

b Check that 13 electrical connectors of wire harnesses 12351498, 12351499, and 12351501 of vehicles 1 thru 344 (p 14-40.2) or 15 electrical connectors of wire harnesses 12352316, 12352353, or 12352315, of vehicles 345 and above (p 14-52.1) are secure. Ensure that keyways are alined, shells are fully seated, and locking rings are fully rotated. If not secure, make sure Optical Fire Sensing Assemblies (OFSA) connectors snap in place. Loosen all other connectors, apply sealing compound (NSN 8030-00-163-5792) and retighten.

c Remove locking pin (5) (p 14-14.2) from two crew compartment extinguishers no. 3 and no. 4 valve actuator guards (2 and 12) (p 14-28) connected by mechanical cable to actuator assembly. Make sure the other two extinguisher's (vehicles 1 thru 344) and four extinguisher's (vehicles 345 and above) locking pins are installed.

d Remove anti-recoil plug (9) (p 14-14.4) from four crew compartment extinguishers (1, 2, 4, and 12) (p 14-28.4) in vehicles 1 thru 344 or from six crew compartment extinguishers (1, 2, 4, and 12) (p 14-28.10) and (13 and 14) (p 14-29) in vehicles 345 and above. Place nozzle on extinguisher (p. 14-29).

e Turn MAINTenance switch on crew T/A panel (1) (p 14-14.3) to horizontal position. Make sure green POWER ON lamp lights and green PASS TEST lamp lights and then goes out indicating that system is operational.

f Momentarily hold SYSTEM TEST/LAMP TEST toggle switch on crew T/A panel to LAMP TEST position. Verify that all four lamps and all LED's light. Time permitting, perform crew AFES system test vehicles 1 thru 344 (p 14-56) or vehicles 345 and above (p 14-60.1).

(5) AFES Manual Discharge System

a Make sure external manual cable pull handle near driver's hatch is safety wired (p 14-55).

b Make sure actuator assembly (p 14-52.20) cables are tight.

c Remove locking pin (5) (p 14-14.4) from engine extinguisher no. 2 valve actuator guard (12) (p 14-28.1). Do not remove locking pin from engine extinguisher no. 1 valve actuator guard (p 14-14.4).

(6) Move projectile racks to forward compartment (TM 9-2350-267-10).

B Run engine until preservative oil is out of combustion chambers and engine is operating smoothly. Check for fuel and oil leaks immediately.

NOTE

Due to internal processing, engine may start hard, smoke, and run rough. Conditions should improve after approximately 5 minutes running time. Conduct troubleshooting procedures if engine fails to develop full power after 5 minutes.

NOTE

Preservative engine oils PE1 and PE2 are identical to engine oils OE-10 and OE-30, except they contain a preservative. PE1 and PE2 will be used in the same manner as regularly used engine oils OE-10 or OE-30. PE1 or PE2 will be used in the transmission until the first scheduled 2000-mile or semiannual oil change. Refer to LO 9-2350-267-12 for lubrication instructions.

C Perform complete annual service.

CHECKING UNPACKED EQUIPMENT

A Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

B Check equipment against packing slip to see if shipment is complete. Report all discrepancies in accordance with instructions in DA Pam 738-750.

C Check ammunition issued for .50-caliber machine gun M2, and personnel weapons to verify ammunition received was ammunition requisitioned. Conduct visual check of all ammunition for scratches, dents, grease and other conditions which could make use of ammunition hazardous.

DEPROCESSING UNPACKED EQUIPMENT

A Clean all tools and equipment.

B Properly stow all basic issue items in designated stowage areas (TM 9-2350-267-10).

C Cleaning rust-preventive compound from vehicle and components will be done in accordance with p 2-2.

TOOLS, TEST EQUIPMENT AND MATERIALS REQUIRED FOR INSTALLATION (Appx B)

ASSEMBLY OF EQUIPMENT

The M992 vehicle equipment and systems are shipped as assembled units. Assembly is not required upon receipt of equipment. However, assembly of related components is discussed in detail in Chapters 3 thru 16 of this manual. These chapters provide detailed information on removal, disassembly, assembly and installation of equipment for maintenance purposes at the organizational level.

INSTALLATION INSTRUCTIONS

General location of vehicle on-board equipment, equipment racks/brackets and stowage equipment is shown on p 1-6.

Removal and installation of components for maintenance purposes are covered in detail in Chapters 3 thru 16 of this manual.

INTERCONNECTIONS

Interconnection wiring data for equipment which is not permanently installed in the M992 is discussed in detail in Chapter 6 in this manual.

PRELIMINARY SERVICING AND ADJUSTMENT OF EQUIPMENT

Equipment faults disclosed during preliminary inspection and servicing or during break-in period will be corrected by Organizational or Support Maintenance.

REPORTING UNSATISFACTORY CONDITIONS

Serious equipment faults which appear to involve unsatisfactory design or material will be reported on SF 368, Quality Deficiency Report (Category II), as prescribed in DA Pam 738-750.

PREOPERATIONAL SERVICING AND ADJUSTMENT

Conduct general overall inspection of the vehicle. Refer to TM 9-2350-267-10.

Check:

A All electrical wires/connectors

B Hydraulic lines/connectors

C Welds

D Bolts

E Seals

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BATTERIES: SERVICING AND CONNECTING

WARNING

Lead-acid battery gases can explode. Do not smoke, have open flames, or make sparks around a battery. Be especially careful if caps are removed from battery. If battery is gassing, it can explode, causing injury.

Turn OFF vehicle MASTER switch. When disconnecting batteries, remove ground cables first. Connect batteries, remove ground cables first. Connect ground cables last when connecting batteries.

Connect batteries as shown in the hook-up diagram.

A Open two battery access doors.

B Remove six filler caps (1) from each battery.

C Service battery according to TM 9-6140-200-14.

D Replace filler caps.

CAUTION

Install batteries with positive (+) and negative (−) terminals positioned as shown in illustration.

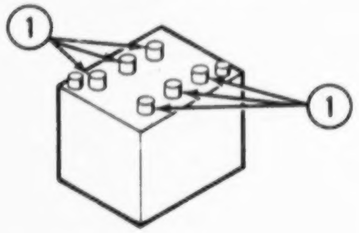
E Install two battery cables (2).

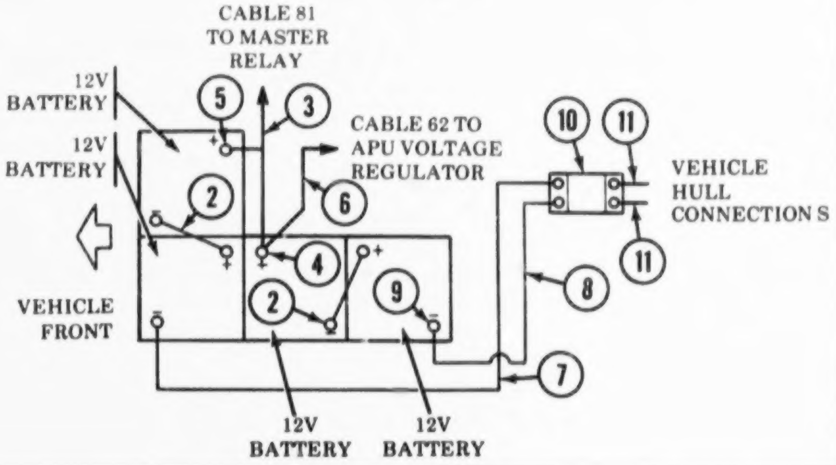
F Connect cable 81 (3) to terminals (4 and 5), and connect cable 62 (6) to terminal (4) also.

G Install two ground cables (7 and 8) between terminals (9) and shunt (10).

H Install two cables (11) from shunt (10) to vehicle hull connections.

I Close and secure two battery access doors.




CABLE 81 TO MASTER RELAY
12V BATTERY
12V BATTERY
⑤
③
CABLE 62 TO APU VOLTAGE REGULATOR
⑩
⑪
VEHICLE HULL CONNECTION S
②
⑥
④
⑪
VEHICLE FRONT
②
⑨
⑧
⑦
12V BATTERY
12V BATTERY

TA58104

RADIATOR FAN PROTECTIVE SCREENS: REMOVAL AND INSTALLATION

INITIAL SETUP

Special Tools

Screen assembly, protective (item 28.1, Appx B)

REMOVAL

WARNING

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when engine is in ground hop mode. Contact with rotating fan can cause injury.

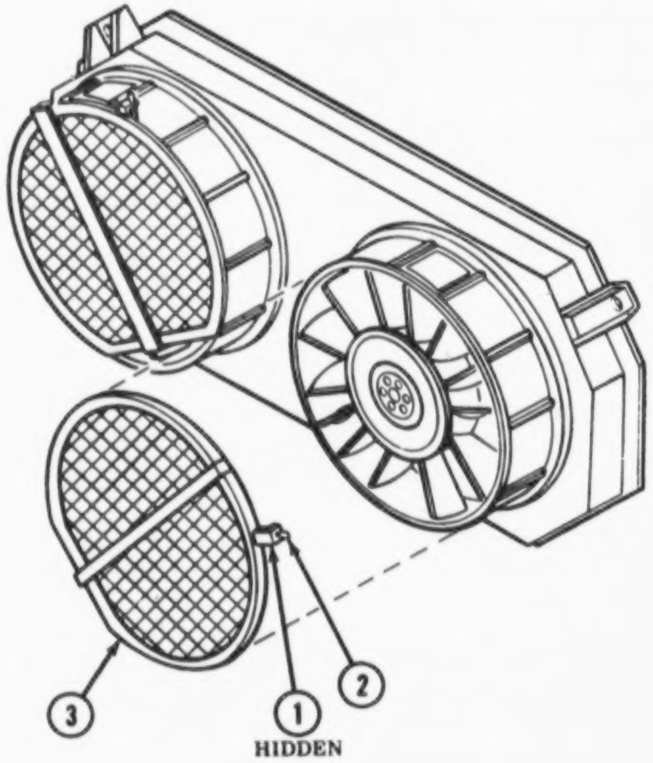
Loosen locknut (1) and thumb or hex-head screw (2). Remove protective screen (3).

INSTALLATION

NOTE

Flat side of screen should aline with two lower mounting bolts of fan housing.

Install protective screen (3), thumb or hex-head screw (2), and locknut (1).



TA58105

Section III PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

GENERAL

Preventive maintenance is step-by-step care, inspection, maintenance and service of equipment to find and correct problems before extensive time-consuming repairs or replacements are required. Refer to DA Pam 738-750 for instructions on use of forms for preventive maintenance services.

This section contains procedures and instructions needed to conduct organizational preventive maintenance checks.

INTERVALS

Preventive maintenance service intervals at organizational maintenance level are quarterly and annually, 750 miles or 75 hours, whichever occurs first. This is scheduled on DD Form 314 in accordance with DA Pam 738-750.

Clean and lubricate after operation in:

- Water
- Mud
- Sand

LUBRICATION ORDER

For detailed location, intervals, lubricant specifications and step-by-step lubrication instructions refer to LO 9-2350-267-12.

PROCEDURES

ROUTINE APPLICATIONS: Operator's manual TM 9-2350-267-10 contains important and necessary information the organizational maintenance level mechanic must know to maintain and operate the vehicle.

VEHICLE CLEANLINESS: The vehicle should be reasonably clean when brought in for scheduled organizational maintenance. It should be dry, and not caked with mud.

NOTE

Do not wash vehicle immediately before scheduled inspection. Loose parts and oil leaks are not as noticeable after washing.

CAUTION

Do not direct a stream of water against grilles, exhaust openings, FES components, or open oil and fuel fill ports. Operate bilge pump after washdown to remove water from engine compartment.

SERVICES

Organizational services are defined by, and limited to, the following general procedures. High level maintenance services shall be approved by the supporting maintenance unit.

ADJUST. Make all needed adjustments using instructions in this manual and/or technical bulletins.

CLEAN. Wash the unit to remove old lubricant, dirt and other foreign matter. Special cleaning instructions are given as needed.

INSPECT. Determine the serviceability of an item by comparing physical, mechanical and/or electrical characteristics with established standards through examination.

SERVICE. Includes fluid fill operations such as radiator coolant level, battery electrolyte level, draining and refilling units with lubrication or hydraulic oil; and, changing or cleaning oil, fuel, and air filters.

TIGHTEN. All nuts, bolts, screws and plugs are tightened to torque values given in this manual. Use accurate torque wrench. If torque value is not given, refer to Torque Value Guide Tables, Appendix C. Do not overtighten fasteners. Be sure to install lockwashers, locknuts, lock wire, and cotter pins where needed.

SPECIAL LUBRICATION. Lubrication as specified by LO 9-2350-267-12 to be conducted on an annual basis; also, any lubrication requirements not specified in LO 9-2350-267-12.

REPAIR. Restore an item to a serviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting and strengthening. Refer to Appendix B for authorized crew and organizational maintenance level repair, replacement and adjustment functions on the M992.

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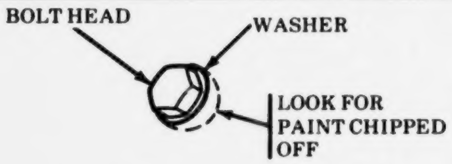
FORMS

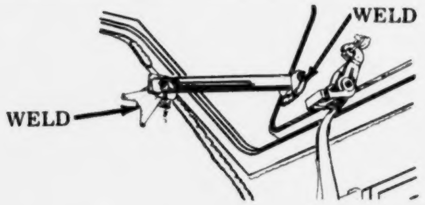
DA Form 2404, Equipment Inspection and Maintenance Worksheet, is used by the mechanic to record periodic maintenance services performed and faults corrected. The item number on the 2404 must be the same as the item number of the PMCS.

COMMON ITEMS

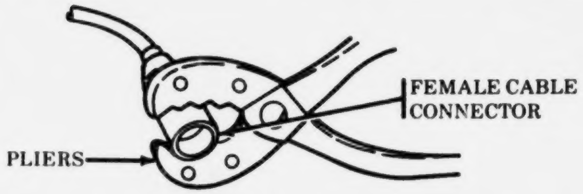
Be sure to check the common items shown on this page as you do PMCS.


BOLT HEAD
WASHER
LOOK FOR PAINT CHIPPED OFF

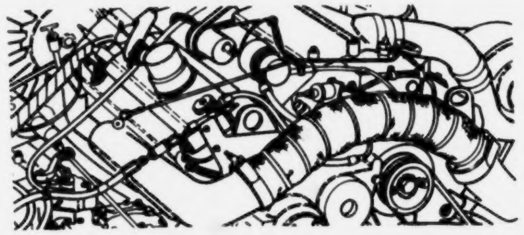
NUTS, BOLTS AND SCREWS. Loose attaching hardware may be hard to spot without using a wrench. Check for loose parts by looking for cracked or chipped paint around bolt heads, and missing or broken cotter pins or lock wire.



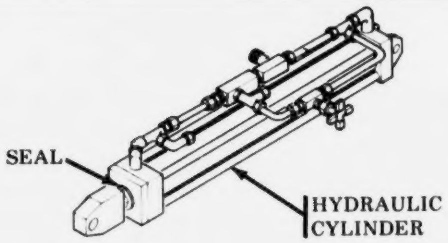
WELDS. Check for damaged welds by looking for rust or chipped paint at seams.


FEMALE CABLE CONNECTOR
PLIERS

ELECTRICAL WIRES AND CONNECTORS. Check electrical wiring for cracked insulation and exposed wires. Tighten loose connectors by slightly flattening female connector with pliers as shown.



HOSES AND TUBES. Check all hoses and tubes for rubbing damage, leaks, loose fittings and loose clamps.


SEAL
HYDRAULIC CYLINDER

SEALS. Check seals for leaks.

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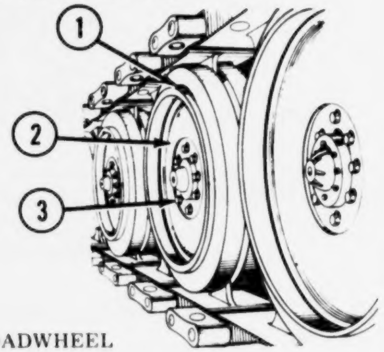
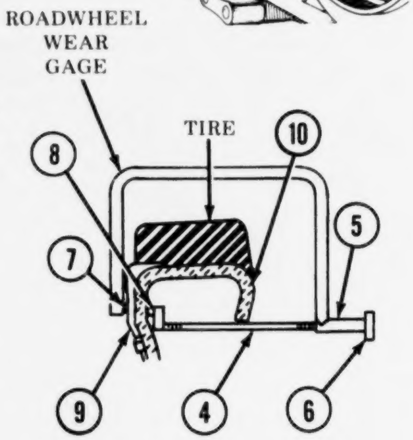
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
1			•		75	750	Lubrication	Lubricate vehicle as instructed in LO 9-2350-267-12.
2			•		75	750	Roadwheels and Idler Wheels	 A Inspect roadwheels for rubber separation (1) and missing chunks. B Check for cracks in wheel (2). C Tighten 10 nuts (3) to 180 lb-ft. D Use wear gage 10911904 and measure roadwheel wear as follows:  ROADWHEEL WEAR GAGE TIRE 8 10 5 7 9 4 6 (1) Pull threaded rod (4) through gage bracket (5) enough to allow positioning of gage over roadwheel. (2) Back off knurled knob (6) to end of rod (4). (3) Place gaging ball (7) against outside wear ring (9). (4) Pull rod (4) through bracket (5) and place gaging ball (8) against inside wheel disk (10) while maintaining position of gaging ball (7) against outside wear ring (9).

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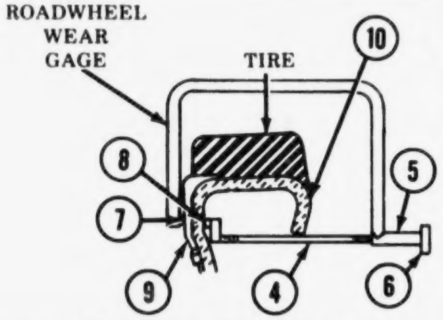
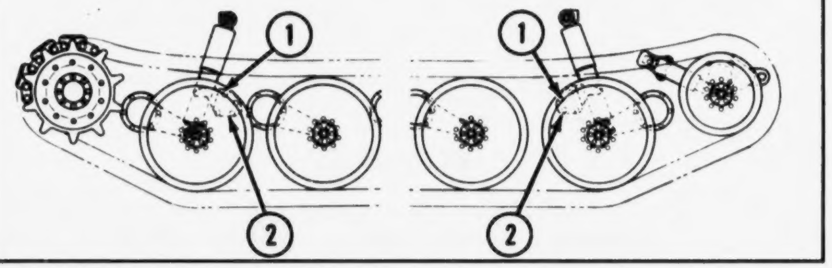
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Roadwheels and Idler wheels (cont.)	(5) Turn knurled knob (6) clockwise until it contacts gage bracket (5). **NOTE** Do not tighten knob (6) or gaging ball (8) will be pulled away from inside disk (10).  ROADWHEEL WEAR GAGE TIRE 10 8 5 7 9 4 6 (6) Pull rod (4) through gage bracket (5) without disturbing position of knob (6) on rod (4), and remove gage from roadwheel. (7) Push rod (4) in until knob (6) contacts gage bracket (5). (8) Measure distance between gaging balls (7 and 8). (9) If distance between balls is 7/16 inch, or less, the roadwheel should be replaced (p 8-11).
3			•		75	750	Bump Stop Brackets	Torque four bolts (1) of each bump stop bracket (2) to 300-350 lb-ft. 

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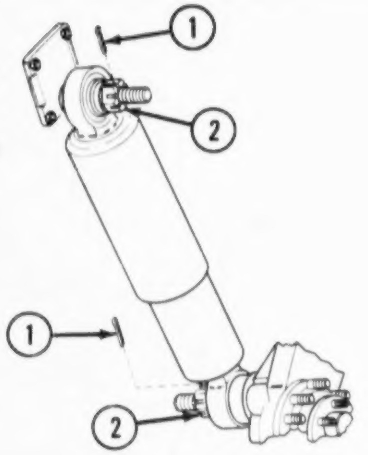
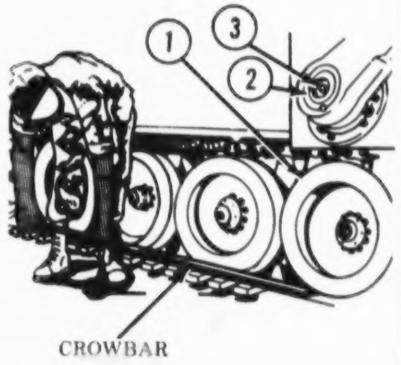
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
4			•		75	750	Shock Absorbers	A Remove two cotter pins (1). B Tighten shock absorber mounting nuts (2) to 100-140 lb-ft. C Replace and install cotter pins (1). 
5			•		75	750	Torsion Bar	A Pry up each roadwheel (1) with a crowbar and check for broken torsion bars. B Fully seat any loose torsion bar plugs (2). C Tighten any loose retaining screws (3). 

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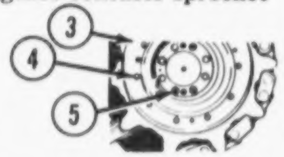
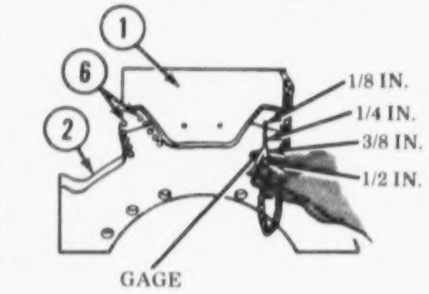
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
ITEM	Q	S	A	B	H	MI		
6			•		75	750	Drive Sprocket and Hubs	A Place template (1) on sprocket (2) between two sprocket teeth and measure between template and sprocket with gage 10954499.
								B Reverse sprocket wheel (3) when wear on drive side of sprocket tooth shows 1/2-inch. **NOTE** Reverse entire sprocket wheel assembly.
								C Replace sprocket (2) when wear on both sides of sprocket tooth is 1/2 inch.
								D Replace sprocket (2) if track shoe center guide contacts sprocket hub.
								E Check sprocket mounting bolts (4) and tighten to 90 lb-ft each. 
								F Check hub mounting bolts (5) and tighten to 450-475 lb-ft.  1 6 2 1/8 IN. 1/4 IN. 3/8 IN. 1/2 IN. GAGE
								G If no gage is available, use check marks (6) to determine wear. Reverse sprocket wheel (3) when sprocket teeth are worn to any mark. Replace sprocket (2) when tooth is worn to mark on both sides (p 8-28).

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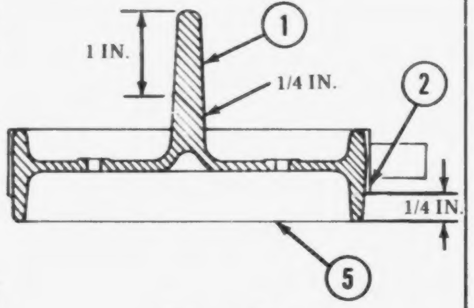
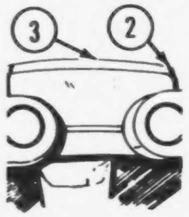
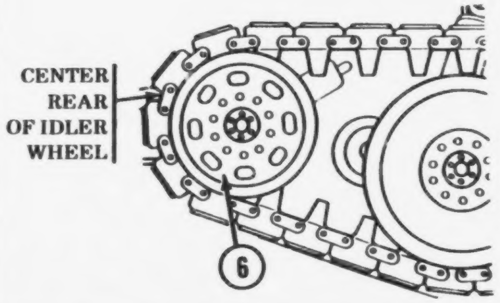
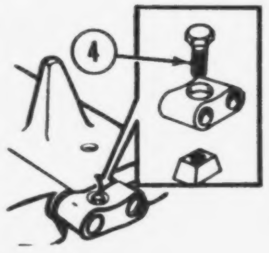
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
7			•		75	750	Tracks	A Measure thickness of center guide (1) at a point 1 inch from end. B Replace track shoe (5) if center guide measures less than 1/4 inch, or if metal grouser (2) measures less than 1/4 inch (p 8-3).  C Replace rubber pads (3) when worn even with metal grouser (2) (p 8-2).  D Position track shoe (5) at center rear of idler wheel (6) and tighten track link connector screws (4) to 85 lb-ft.  

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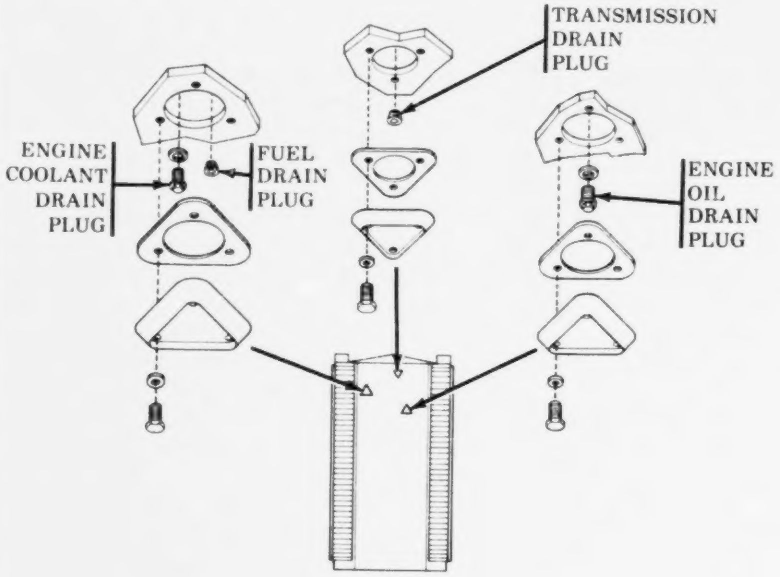
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
8			•		75	750	Drain Covers and Plugs	Replace or secure drain covers and plugs on underside of hull. 

TRANSMISSION DRAIN PLUG
ENGINE COOLANT DRAIN PLUG
FUEL DRAIN PLUG
ENGINE OIL DRAIN PLUG

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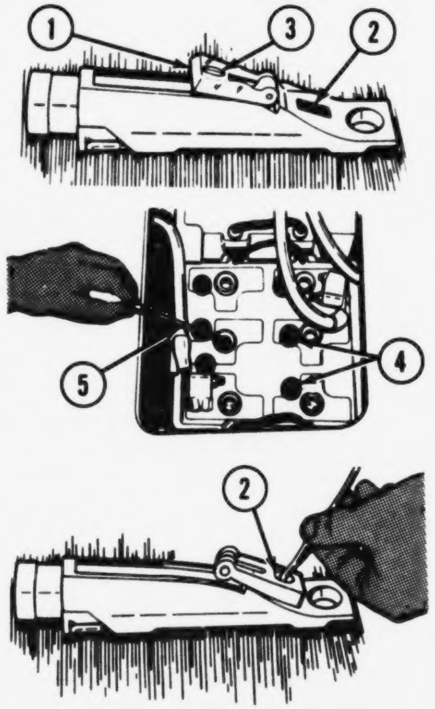
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

	INTERVAL							
ITEM	Q	S	A	B	H	MI	ITEM TO BE INSPECTED	PROCEDURE
9			•		75	750	Batteries	Test specific gravity of electrolyte with duotester as follows: A Swing back plastic cover (1) of duo-check coolant and battery tester. Clean measuring window (2) and bottom cover (3) with a clean soft cloth (item 16, Appx D). B Close plastic cover (1). C Remove battery caps (4) from all cells. D Use dipstick (5) to obtain a small sample of battery acid. E Place a few drops of acid onto measuring surface (2) through opening in plastic cover (1).  **WARNING** Do not look into infrared (blackout) light. If using headlight as a light source, look into white light only. Infrared light can injure the eyes.

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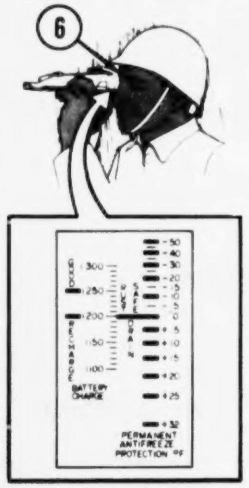
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Batteries (cont.)	F Point instrument toward any light source (headlight) and look into eyepiece (6). Battery charge is indicated at a point on left-hand part of scale where the dividing line between light and dark (shadow) crosses scale.
								G Repeat steps C through F and check all four batteries.
								NOTE Experience will enable you to quickly determine contrast between light and dark portions of field of view. Tilt instrument toward light source until best results are obtained. If edge of the indicating shadow is not sharp, measuring surface was not sufficiently cleaned or dried.  6 GOOD RECHARGE 300 250 200 150 100 BATTERY CHARGE RUST SAFE DRAIN -50 -40 -30 -20 -15 -10 -5 0 +5 +10 +15 +20 +25 +32 PERMANENT ANTIFREEZE PROTECTION °F

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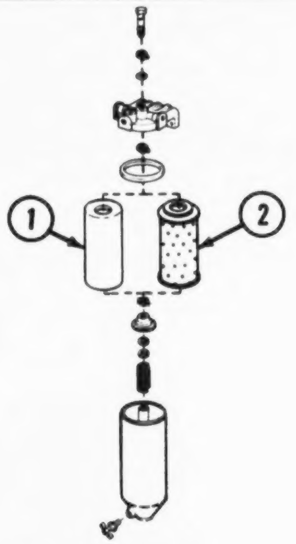
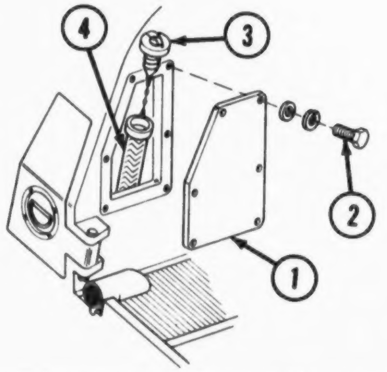
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE	
	Q	S	A	B	H	MI			
10			•		75	750	Fuel System	A	Inspect all fuel lines and fuel line couplings and fittings for evidence of leaks.
								B	Change primary fuel filter (1) and secondary fuel filter (2) (p 4-11 and 4-13). 
11	•						Fuel Fill Strainer	A	Remove six screws (2) and fuel fill access plate (1).
								B	Remove fuel fill cap (3) and inspect cap rubber seal for cracks.
								C	Remove fuel strainer (4) by pulling straight up and out.
								D	Clean strainer (4) with solvent (item 19, Appx D).
								E	If strainer is badly clogged or torn, replace strainer. 

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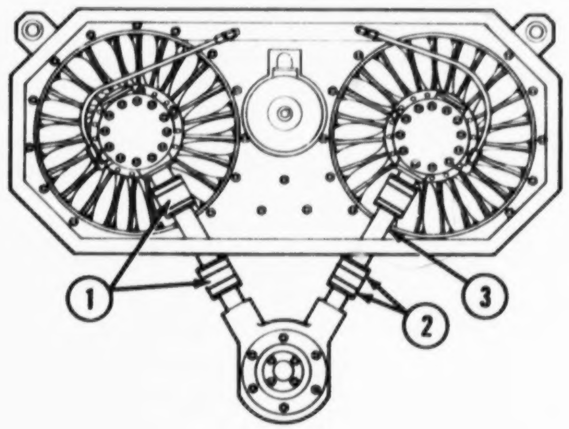
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
12			•		75	750	Engine Fan Drive System	 A Inspect universal joint rubber boots (1) for cracks and tears. B Inspect rubber boot retaining rings (2) for looseness. C Replace universal joint (3) if boots (1) or retaining rings (2) are defective. D Conduct fan gear backlash test as follows: (1) Disconnect both battery ground cables (p 6-44). (2) Open vehicle intake grille for access. (3) Mark any accessible blade (4).

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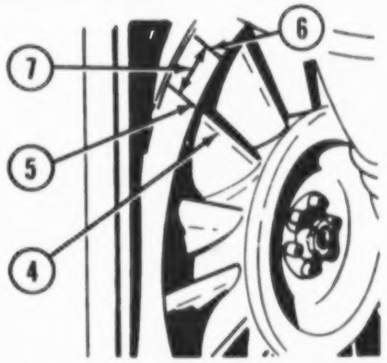
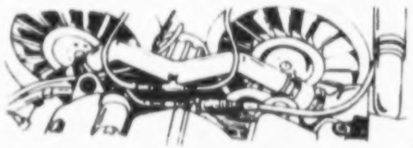
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Engine Fan Drive System (cont.)	(4) While holding opposite fan impeller, rotate marked blade as far left as possible. Mark fan housing directly above mark (5). (5) While holding opposite fan impeller, rotate marked blade as far right as possible. Mark fan housing directly above blade mark (6).  (6) Measure distance between marks (5 and 6). If distance (7) is over 1 inch, backlash is excessive. Notify Direct Support Maintenance.
13			•				Cooling System Radiator Hoses and Pump	**WARNING** Make sure engine is cool before removing radiator cap. Hot coolant can spurt from radiator opening causing severe burns and injury to personnel. A Check for cracked, weak, or broken hoses and signs of leakage. B Check coolant level (TM 9-2350-267-10). 

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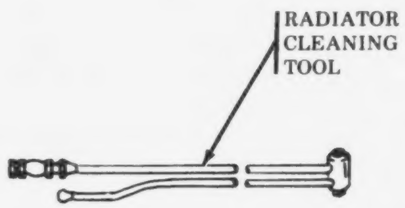
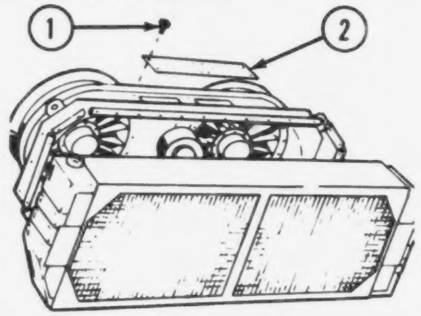
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Cooling System Radiator Hoses and Pump (cont.)	C Remove shroud access cover and inspect drive shafts for wear and loose rubber boots (p 5-21). D Clean radiator with radiator cleaning tool 11641959 to remove deposits of sand, oil, clay and other debris from radiator cooling fins while installed in vehicle. Clean radiator as follows:  (1) Mix one part of detergent, or nontoxic solvent to approximately five parts water in clean suitable container. (2) Remove eight screws (1) and shroud cover (2).  (3) Remove hull drain covers (p 9-26). (4) Cover all exposed engine openings. (5) Connect tool to air supply and insert liquid supply hose in container of solution. (6) Insert tool through shroud cover opening and wet front and back of radiator with solution. Soak for approximately 10 minutes.

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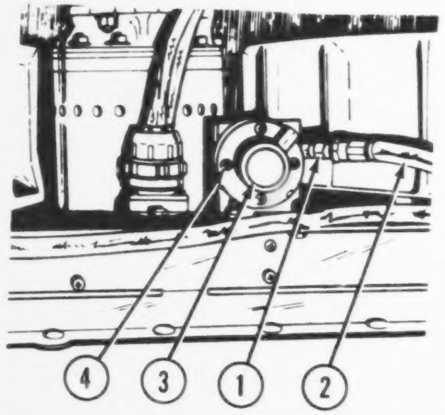
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Cooling System Radiator Hoses and Pump (cont.)	(7) Remove heavy deposits from face of radiator by brushing with medium stiff brush that will not damage fins. (8) Blast radiator with air/liquid mixture, holding head of tool approximately 1/2-inch from face of radiator. Alternate from back to front until a good flow of liquid through radiator is observed over entire area. (9) Flush engine parts and radiator with clear water. Remove hose from container and use air to complete operation. (10) Uncover engine openings and install radiator shroud cover (2) with eight screws (1). Close hull drains. **NOTE** Illustrated cleaning procedures can be found on page 5-20.
14			•		75	750	Cooling System Pressure Relief Valve	Remove and clean pressure relief valve as follows: A Unscrew nut (1) and remove hose (2) from lower end of relief valve (3). B Remove four screws (4). Lift off relief valve (3). 

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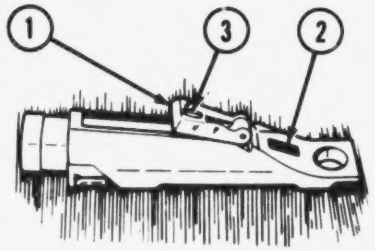
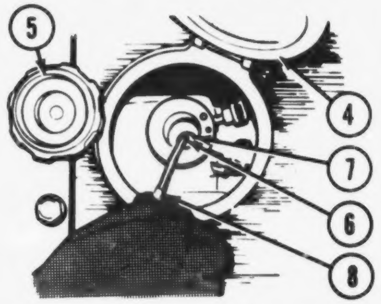
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Cooling System Pressure Relief Valve (cont.)	C Wipe off accumulation of rust. Depress spring to make sure it is not broken. D To install pressure relief valve, reverse removal procedures (p 5-18).
15			•		75	750	Coolant	Test radiator coolant antifreeze level as follows: A Swing back plastic cover (1) of duo-check coolant and battery tester. Clean measuring window (2) and bottom of plastic cover (3) with a soft clean cloth (item 16, Appx D).  **WARNING** Make sure engine is cool before removing radiator cap. Hot coolant will spurt from radiator opening causing severe burns and injury to personnel.  B Open radiator access cover (4). C Slowly remove radiator cap (5). Coolant should be visible. If not, start engine and slowly add coolant until it reaches top of filler neck. Run engine until new coolant is mixed with old coolant.

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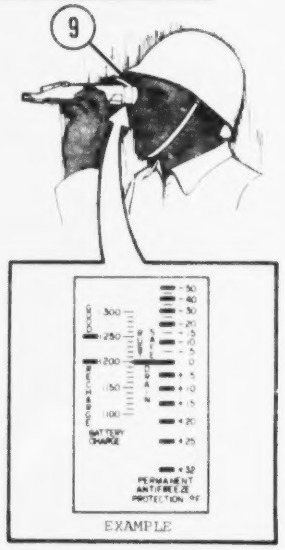
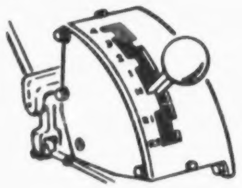
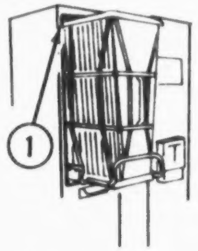
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

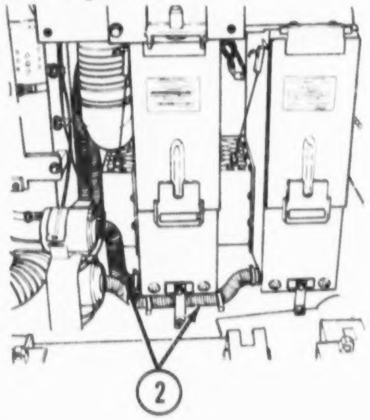
Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

	INTERVAL							
ITEM	Q	S	A	B	H	MI	ITEM TO BE INSPECTED	PROCEDURE
							Coolant (cont.)	D Insert tip of bulb-type syringe into radiator filler neck (7) well below coolant level. Press and release bulb (8) to draw up sample of coolant. E Depress bulb (8), ejecting a few drops of coolant onto measuring window (2) of duo-check coolant tester. **WARNING** Do not look into infrared (blackout) light. If using headlight as a light source, look into white light only. Infrared light can injure the eyes. F Point instrument toward any light source (headlight) and look into eyepiece (9). The antifreeze protection is indicated at a point on right side of scale where dividing line between light and dark (shadow) crosses scale.  9 GOOD RECHARGE 300 250 200 150 100 BATTERY CHARGE SAFE DRAIN -50 -40 -30 -20 -15 -10 -5 0 +5 +10 +15 +20 +25 +32 PERMANENT ANTIFREEZE PROTECTION °F EXAMPLE **NOTE** Experience will enable you to quickly determine contrast between light and dark portions of field of view. Tilt instrument toward light source until best results are obtained. If edge of the indicating shadow is not sharp, measuring surface was not sufficiently cleaned or dried.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
16			•		75	750	Transmission	 Move transmission shift control lever to all positions. The shift control lever should not bind. If binding occurs, adjust linkage (p 7-34).
17	•						Engine Automatic Fire Extinguishing System	Do engine AFES test for vehicles 1 thru 344 (p 14-59) or vehicles 345 and above (p 14-60.5).
18	•						Crew Automatic Fire Extinguishing System	A Clean OFSA lenses (TM 9-2350-267-10). B Do crew AFES test for vehicles 1 thru 344 (p 14-58) or vehicles 345 and above (p 14-60).
19	•						Air Cleaner Filter	**WARNING** If NBC exposure is suspected, all air filter media will be handled by personnel wearing full NBC protective equipment.  A Check for worn or missing seals (1) and hoses (2). B Check blower motors for proper operation and troubleshoot if necessary (p 2-113). C Clean, repair, or replace motors, seals and filter packs as required (p 4-25).

<table>
<tr><th colspan="9">PREVENTIVE MAINTENANCE CHECKS AND SERVICES
Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES</th></tr>
<tr><th rowspan="2">ITEM</th><th colspan="6">INTERVAL</th><th rowspan="2">ITEM TO BE INSPECTED</th><th rowspan="2">PROCEDURE</th></tr>
<tr><th>Q</th><th>S</th><th>A</th><th>B</th><th>H</th><th>MI</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Air Cleaner Filter (cont.)</td><td>CAUTION
Clean filter packs with compressed air only.
WARNING
Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles, shield, gloves, etc.)
D Fan out element and shake out dust. Filter elements with holes or ruptures must be replaced.
 </td></tr>
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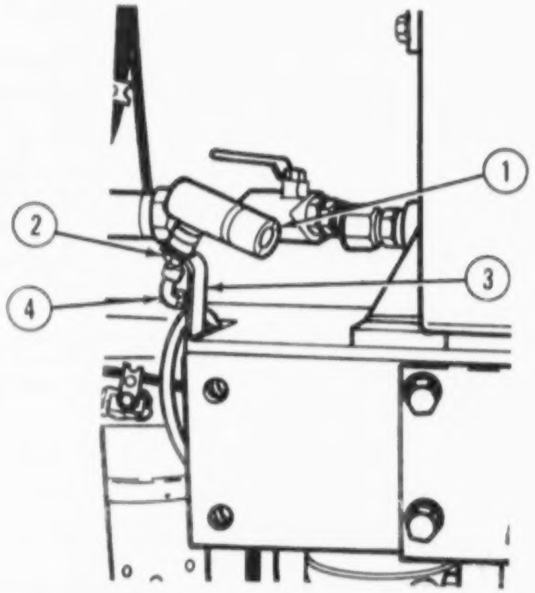
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
19	•						Air Cleaner Restriction Indicator	A Check housing of restriction indicator (1) for cracks and other damage. B Tighten mounting nuts and bolts (2) to make sure indicator (1) and indicator mounting bracket (3) are secure. C Inspect vacuum hose (4) for leaks and loose fittings. D Inspect mounting gasket of indicator for evidence of deterioration.



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PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL Q	S	A	B	H	MI	ITEM TO BE INSPECTED	PROCEDURE
20			•				Neutral Safety Switch	**WARNING** Clear personnel and equipment from near vehicle. A Set vehicle brake. B Shift transmission selector into gear. C Pull out FUEL SHUT OFF handle to OFF position. D Turn MASTER switch ON. E Attempt to crank engine with STARTER switch. F If starter engages, STOP IMMEDIATELY. Adjust neutral safety switch (p 6-16).
21	•				75	750	Engine	A Start engine (TM 9-2350-267-10). B Determine if engine develops adequate cranking speed. C Listen for unusual noises in engine and generator (alternator) that might indicate mechanical problems or inadequate lubrication. D Make repairs as necessary.

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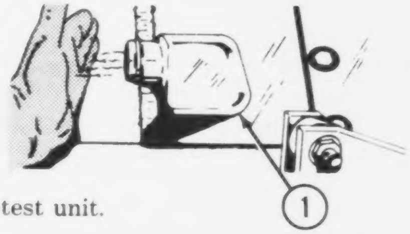
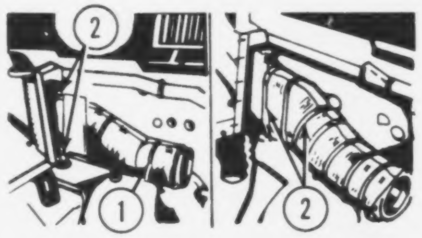
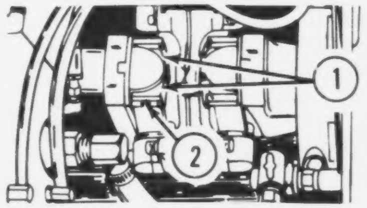
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
22	•				75	750	Bilge pump	**CAUTION** Do not dry-test bilge pump longer than 1 minute.  A Turn on bilge pump and dry-test unit. B Air should be felt at bilge pump outlet (1). If not, troubleshoot bilge pump (p 2-184).
23	•				75	750	Exhaust Ducts	 A Inspect ducts for damage. B Check for loose clamps (1) and mounting bolts (2). C Replace defective exhaust duct components (p 4-32).
24			•		75	750	Final Drive Universal Joints	 A Inspect for missing or broken lock wires (1); if broken or missing, tighten mounting bolts (2) to 90 ± 10 lb-ft.

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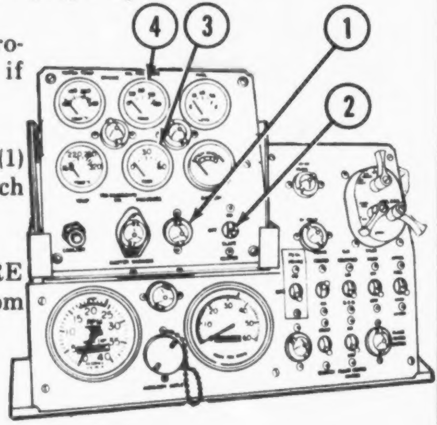
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
								NOTE Conduct road test to check items 25 thru 28.
25			•		75	750	Instrument Panel	A Check all lights and gages for proper operation. B Follow troubleshooting procedures in Chapter 2, if malfunction appears.  C MASTER switch indicator (1) lights when MASTER switch (2) is ON. D ENGINE OIL PRESSURE gage (3): 30-50 psi at 1000 rpm and 50-70 psi at 2100 rpm. **NOTE** A reading of 70 psi is maximum. E TRANSMISSION OIL PRESSURE gage (4): 18-45 psi is normal at 1835-1900 rpm.

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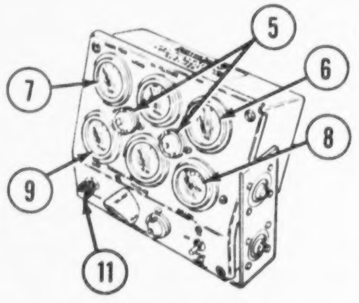
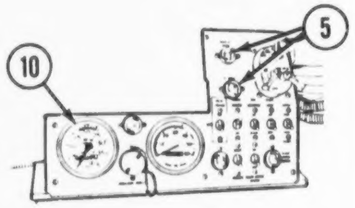
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Instrument Panel (cont.)	**NOTE** A reading of 10 psi at 1000 rpm is minimum.  F INSTRUMENT PANEL light (5) illuminates panel. G FUEL gage (6) registers full when fuel tanks are full. H WATER TEMP gage (7) registers higher temperature as engine warms up. I BATTERY generator indicator (8) registers battery charging rate.  J TRANSMISSION OIL TEMP gage (9) registers higher oil temperature as transmission warms up. **NOTE** 220°-240°F is normal. K TACHOMETER (10) registers indicated engine speed in rpm. L LOW COOLANT LEVEL INDICATOR (11): registers low engine coolant level.

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PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
26			•		75	750	Steering Control	A Move steering wheel through entire range. Observe if steering response is satisfactory. B With vehicle operating at 15 to 20 mph and steering wheel centered, observe if there is any tendency to wander or to pull to one side. C Troubleshoot if required (p 2-90).
27			•		75	750	Brakes	A Accelerate vehicle to 15 mph, release accelerator pedal and apply brakes. Vehicle should stop without pulling to one side. B With the vehicle stopped on an incline and with transmission in neutral, depress brake pedal and apply parking brake. Brake should lock securely and hold vehicle in place. C Adjust brakes if required (p 7-40).
28			•		75	750	Engine Governed Speed and Performance	A Test engine for acceleration and power in each gear. While testing in first gear, accelerate with wide-open throttle from low speed. Governed speed under load should not exceed 2350 rpm.

CAUTION

Observe maximum speed limitations.

GEAR	MAXIMUM SPEED
1st	6 mph
2nd	9 mph
3rd	24 mph
4th	35 mph
R1	5 mph
R2	7 mph

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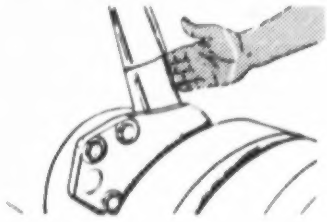
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
29			•		75	750	Temperature of Hubs and Shock Absorber	A Feel all wheel hubs cautiously. Notice difference in temperature between hubs. An overheated hub indicates a bearing problem (p 8-13).
								B Feel the lower end of the shock absorber. Check for difference in temperature between hull and shock absorber. If shock absorber is operating properly, it will be warmer than the hull (p 8-26). 
								C Repair or replace defective components as necessary.
30			•		75	750	Leakage from Powerpack	A Inspect all areas inside of engine compartment and underneath vehicle for fuel, water or engine/transmission leakage.
31			•		75	750	Decals, Instruction Plates and Paint	A Replace decals and instruction plates as necessary.
								B Clean and paint bare or worn spots.
32			•		75	750	Final Road Test	A Check for proper performance of items that were adjusted, repaired or replaced as a result of the road test.

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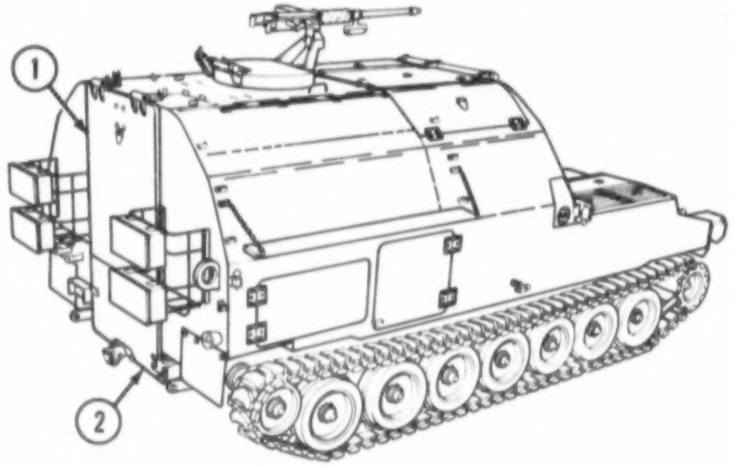
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
33			•				Rear Doors	A Inspect both upper and lower rear doors (1 and 2) for loose, damaged or deteriorated door seals (p 9-35 and 9-40). B Check operation of top rear door (1). Inspect hydraulic lines and fittings for leaks, damage and deterioration. Be sure door will hold and stay in opened position (p 9-30). C Check latch operation of lower rear door (2). Check that door opens freely, and locks in opened position (p 9-36 thru 9-39). D Check for cracked hinges, broken latches and missing or loose bolts (p 9-28 thru 9-39). E Repair or replace components as necessary. 

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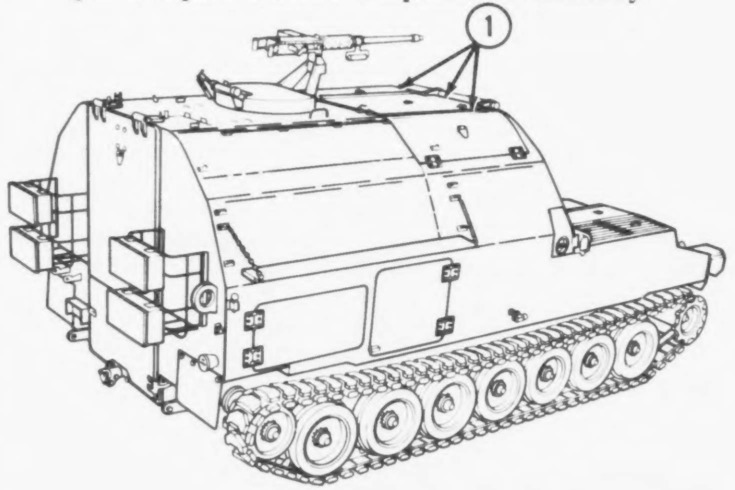
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
34			•				Top Doors	A Check operation and fit of all three top doors (1) (TM 9-2350-267-10). B Inspect doors for loose, damaged or deteriorated door seals (p 9-58). C Check inside latch operation of top middle door (p 9-57). D Inspect hinges and hinge operation. Check for cracked hinges, latches and attaching bolts (p 9-50 thru 9-57). E Check spring assist of torsion bars by opening and closing middle top door. Replace torsion bars as necessary (p 9-55). F Repair or replace defective components as necessary.



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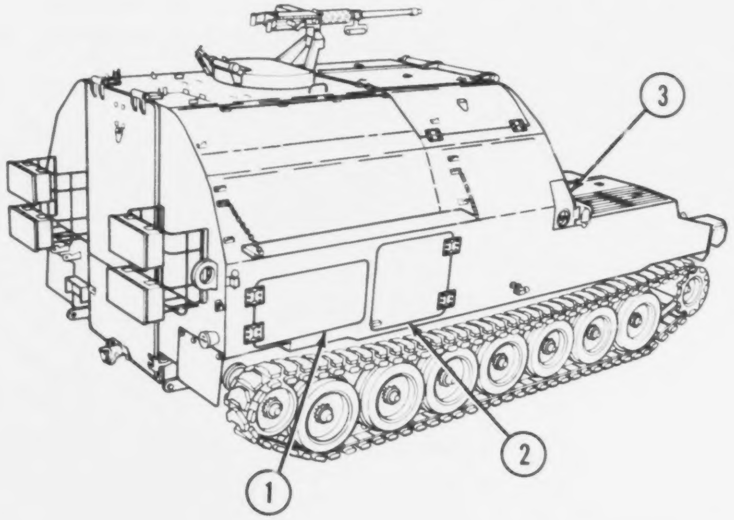
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
35			•				Left and Right Side Doors, Personnel Side Door and Fuel Fill Door	A Inspect left and right canister doors (1) and personnel side door (2) for loose, damaged or deteriorated door seals (p 9-48). B Check that doors latch securely and operate freely. Inspect free operation of hinges. C Check fit of fuel fill door (3). Check for proper door and latch operation (p 9-64). D Repair or replace defective components as necessary.



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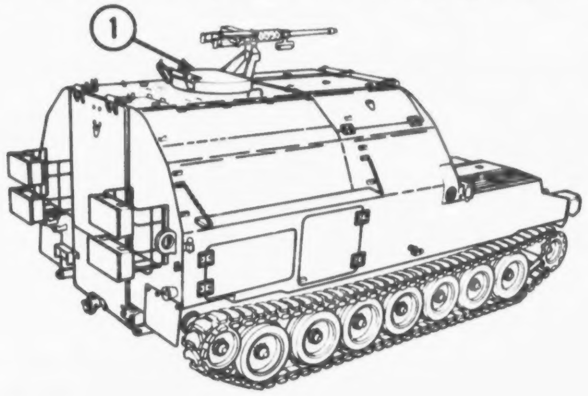
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
36			•				APU Compartment Front and Side Doors	A Check that doors latch securely and operate freely (p 9-62). B Check hinges for free operation (p 9-60). C Repair or replace defective components as necessary.
37			•				Commander's Cupola	A Rotate cupola (1) to ensure ease of rotation. B Operate cupola door latches and locks in both open and closed position to ensure ease of operation. C Check seals for tears and deterioration. D If repairs or replacement of components is necessary, notify Direct Support Maintenance.
38			•				Fenders and Rear Splash Guards	A Inspect for dents, cracks, breaks or other damage. B Repair or replace components as necessary (p 9-66 and 9-67). 

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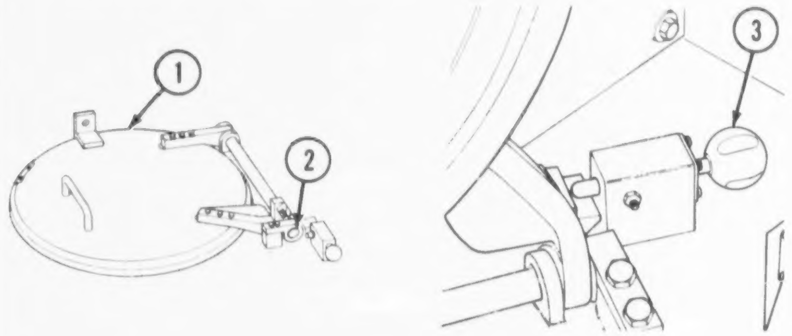
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE	
	Q	S	A	B	H	MI			
39			•				Commander's, Driver's and Crew Seats	A	Inspect seats for torn cushions and backrests.
								B	Check adjusting mechanisms and trip levers for smooth operation.
								C	Check seat belts and buckles for proper operation.
								D	Check frames for breaks and other damage.
								E	Repair or replace defective components (p 9-1 thru 9-17).
40			•				Driver's Hatch	A	Inspect driver's hatch cover (1). Check locking chuck and handle for damage.
								B	Check for broken torsion bar (2).
								C	Inspect hold-open lock (3) for proper operation. Check hatch cover and lock engagement.



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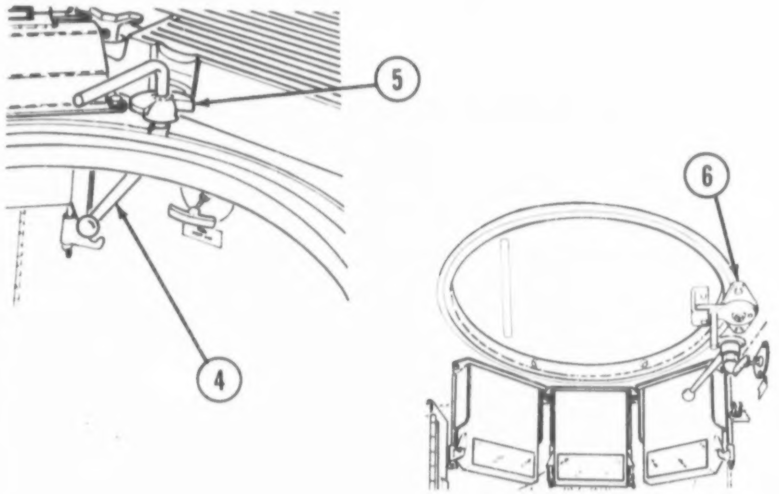
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Driver's Hatch (cont.)	D Operate hatch from outside and inside of vehicle. Check locking handles (4 and 5). E Check operation of security latch (6). F Repair or replace components as necessary (p 9-18). 
41			•				Stowage Boxes	A Inspect and repair locks and hinges. B Tighten loose mounting bolts.

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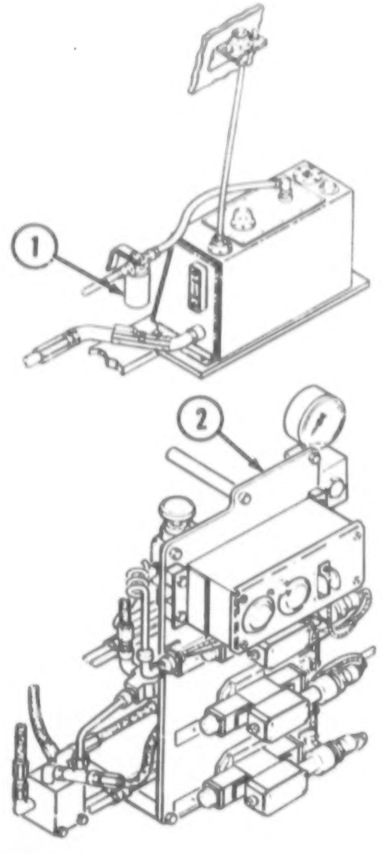
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
42	•						Hydraulic System	A Service hydraulic reservoir oil filter (1) (LO 9-2350-267-12). B Inspect hydraulic lines and fittings for leaks, damage and deterioration (p 16-1). C Operate primary hydraulic system and backup hydraulic system and listen for unusual noises which might indicate problems in the system (TM 9-2350-267-10). D Operate hydraulic-powered systems and check hydraulic control panel (2). Inspect for leaks, loose mounting hardware and loose electrical connections. Operate hydraulic-powered systems using manual override on control valves (TM 9-2350-267-10). E Troubleshoot system as necessary (p 2-234 and 2-235). 

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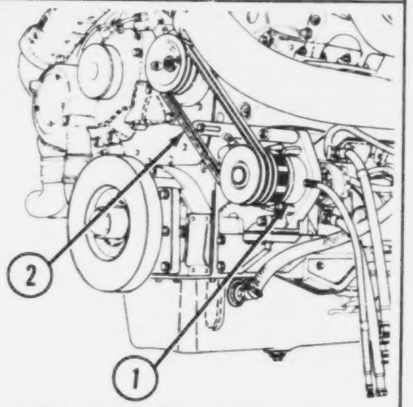
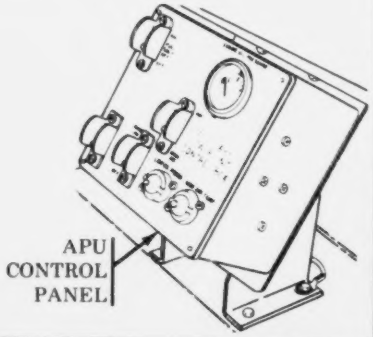
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
43			•				Backup Hydraulic System	A Open engine compartment access plate (p 3-14) and inspect backup hydraulic pump (1). Check condition of V-belts (2), tension and alinement (p 16-26). B Inspect hydraulic lines for leaks and tighten any loose fittings (p 16-22). C Inspect and tighten loose mounting hardware (p 16-24). 
44	•						Auxiliary Power Unit	A Start APU (TM 9-2350-267-10). Listen for unusual noises in engine and generator/starter which might indicate mechanical malfunction. B Remove APU panel lenses for LOW OIL PRESSure and HIGH AIR TEMP lights. Remove bulbs and visually check bulbs for broken filaments. Replace if necessary. C Check ENGINE OIL PRESSURE gage; gage should indicate 25-35 psi. D Tighten fuel, oil and air connections that leak. E Troubleshoot APU as necessary (p 2-244). 

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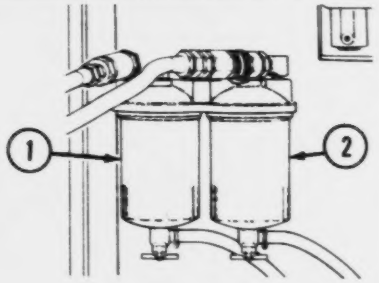
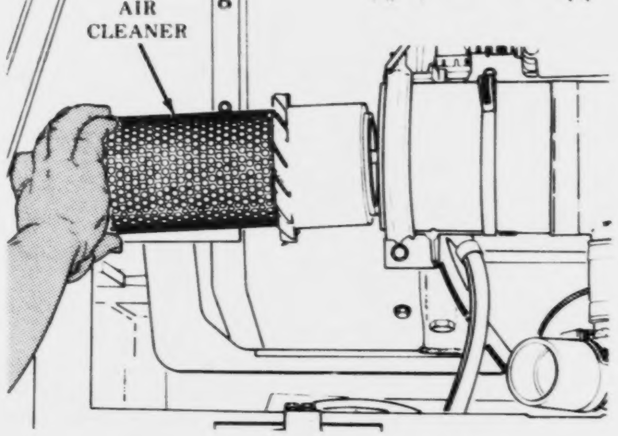
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
45					•		APU Fuel Filters	A Replace primary fuel filter (1) every 600 hours (p 13-16). B Replace secondary fuel filter (2) every 3000 hours (p 13-16).  
46	•						APU Air Cleaner	A Inspect air cleaner (1) for cleanliness and obstructions (TM 9-2350-267-10). B Inspect air system components and replace if damaged or deteriorated (p 13-15).

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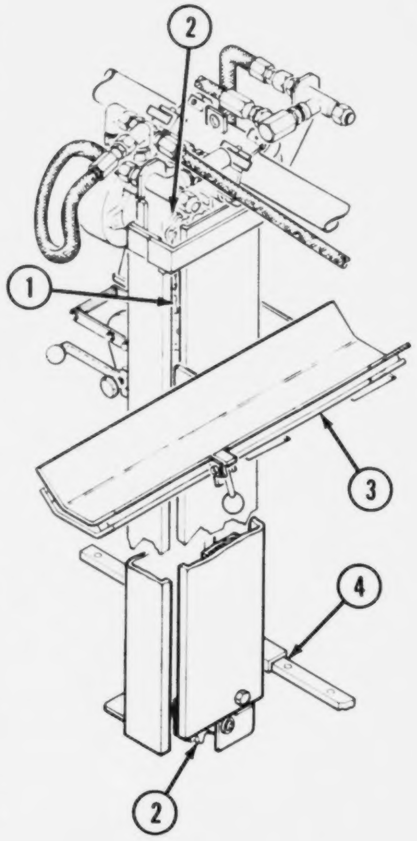
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
47			•				Stacker	A Operate stacker (TM 9-2350-267-10) tray up and down and check action of roller chain (1). Chain must operate freely without binding or sticking. B Move stacker horizontally and check for binding or sticking. C Remove outer chain guard (p 12-31) and visually inspect drive and idler sprockets (2) for worn or broken teeth. D Check chain tension (TM 9-2350-267-10). E Inspect hydraulic lines and check fittings for leakage. Tighten fittings as necessary (p 16-32). F Check operation of sliding tray (3). G Visually inspect components for wear, cracks and other damage. 

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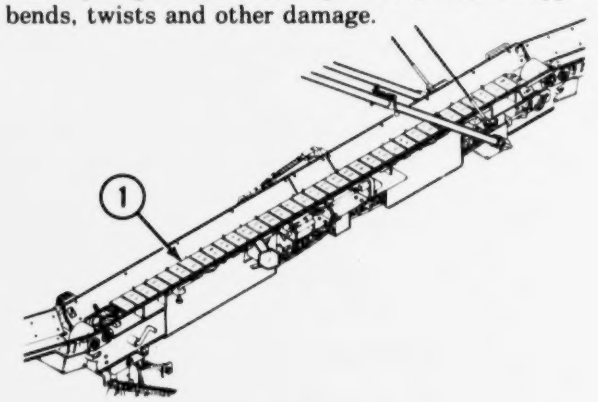
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Stacker (cont.)	H Inspect and tighten loose mounting hardware (p 12-34).
								I Inspect floor-mounted wear strip (4) for condition and tighten mounting hardware as necessary (p 12-41).
								J Check winch operation.
								K Check operation of stacker foot brake adjust if necessary (p 12-40).
								L Repair or replace defective components as necessary (p 12-30 thru 12-45).
48			•				Conveyor	A Operate conveyor (TM 9-2350-267-10) and check action of conveyor chain (1). Chain must operate freely, without binding or sticking.
								B Visually inspect chain, conveyor sections, and supports for cracks, bends, twists and other damage. 

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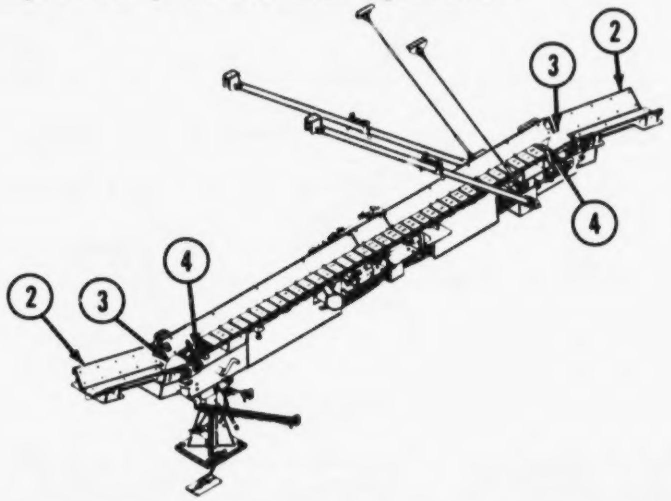
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							Conveyor (cont.)	C Check chain tension (TM 9-2350-267-10).
								D Check end sections (2) for security and ease of operation.
								E Check for ease of folding conveyor to stowage position and back to operating position (TM 9-2350-267-10).
								F Check that rollers (3) and sprockets (4) are undamaged. Inspect for broken or worn sprocket teeth, and worn or damaged rollers.
								G Inspect conveyor hydraulic lines and fittings for leakage and tighten loose fittings (p 16-36).
								H Inspect and tighten loose mounting hardware.
								

TA310378

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

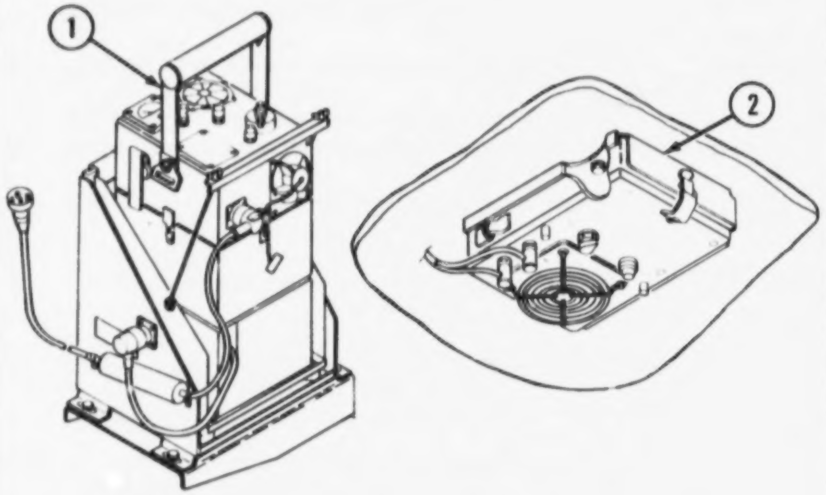
ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE	
	Q	S	A	B	H	MI			
							Conveyor (cont.)	I	Inspect for worn or damaged wear strips.
								J	Inspect conveyor chain pads. Replace as necessary (TM 9-2350-267-10).
								K	Repair or replace defective components as necessary (p 12-1 thru 12-29).
49			•				Projectile Racks	A	Inspect projectile rack for cracks, bends, twists and other damage.
								B	Inspect locking mechanisms for damage and wear. Make sure locking mechanisms securely hold projectile in rack.
								C	Tighten loose screws. Replace missing screws, washers and nuts.
								D	Repair or replace defective components (p 11-1 thru 11-10).
50			•				Canister Racks and Fuze Containers	A	Inspect for cracks, bends, wear and other damage.
								B	Tighten loose screws. Replace missing screws, washer and nuts.
								C	Inspect restraint straps and restraint bars.
								D	Repair or replace defective components (p 11-12 thru 11-23).
51			•				Electrical System Wiring Harnesses and Cables	A	Inspect harnesses and cables for damaged insulation and deterioration (Chapter 6).
								B	Tighten loose electrical connection mounting brackets and clamps. Check for broken or damaged terminals and replace or repair as necessary. Ref. (p 2-50 thru 2-60)
								C	Replace missing chassis grommets.

TA310379

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

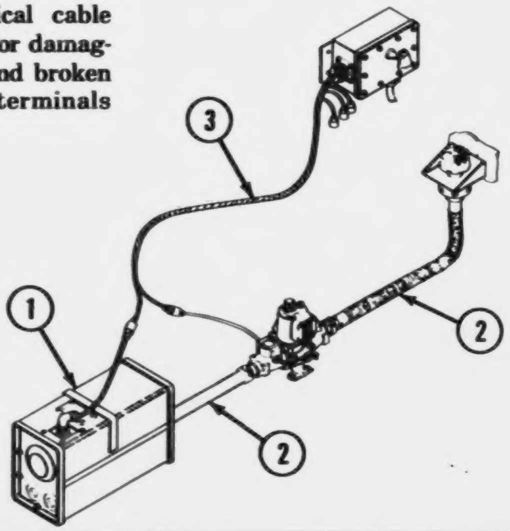
ITEM	INTERVAL Q	S	A	B	H	MI	ITEM TO BE INSPECTED		PROCEDURE
52			•				Dome Lights	A	Test operation of lights (TM 9-2350-267-10).
								B	Replace broken, cracked or discolored lamps or lenses (p 6-40).
53	•						Chemical Detector and Alarm System	A	Check chemical detector (1) and alarm system (2) for proper operation. Refer to TM 3-6665-225-12 for maintenance procedures. Removal and installation can be found on (p 14-13 and 14-14).



TA310380

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

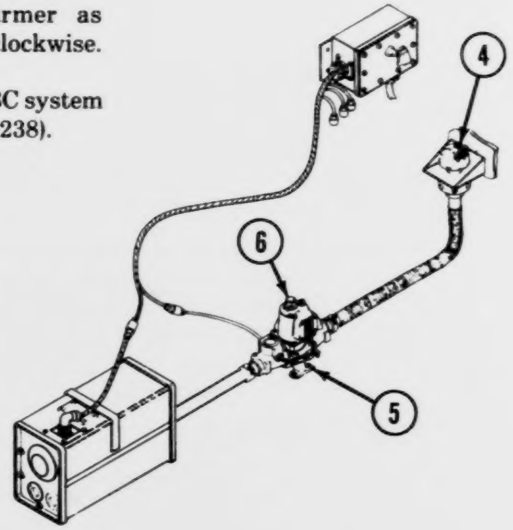
Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL Q	S	A	B	H	MI	ITEM TO BE INSPECTED	PROCEDURE
54	•						NBC Equipment	**WARNING** After suspected NBC exposure of this vehicle, all air filter elements shall be handled only by personnel wearing full NBC protective equipment. A Inspect M2A2 precleaner (1) for dents, loose connections and missing parts. Replace filters if damaged (p 14-2 thru 14-6). Refer to TM 9-2350-267-10 for filter change information. B Inspect condition of hose assemblies (2). Check for deterioration, loose connections, holes, tears and other damage (p 14-8). C Inspect electrical cable assemblies (3) for damaged insulation and broken or damaged terminals (p 6-109). 

TA310381

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM	INTERVAL						ITEM TO BE INSPECTED	PROCEDURE
	Q	S	A	B	H	MI		
							NBC Equipment (cont.)	D Operate ventilated face piece system (TM 9-2350-267-10). Check that air moves through each air hose outlet orifice connector (4). **NOTE** Allow M3 heater to operate for approximately 15 minutes before checking for warm air circulation. E Check operation of M3 heater (5) by turning control knob (6) ON. Indicator light should be lit and air should get warmer as knob is turned clockwise. F Troubleshoot NBC system if defective (p 2-238). 

TA310382

Section IV STE/ICE TROUBLESHOOTING

GENERAL

TM 9-4910-571-12&P provides instructions for operation and maintenance of the Simplified Test Equipment/Internal Combustion Engines (STE/ICE) equipment.

This section contains detailed procedures for performing the STE/ICE tests applicable to the M992 as referenced in Section V troubleshooting and the Vehicle Test Card.

The Vehicle Test Card for use with the STE/ICE equipment is located on p 2-48.47.

STE/ICE TEST TASK INDEX

TASK	PAGE
Hook Up STE/ICE Test Equipment to DCA	2-48.2
Hook Up STE/ICE Test Equipment on Batteries	2-48.4
STE/ICE Test No. 10 Engine RPM (Cranking)	2-48.6
STE/ICE Test No. 10 Engine RPM (Idle)	2-48.7
STE/ICE Test No. 10 Engine RPM (Governor Speed)	2-48.8
STE/ICE Test No. 13 Power (Percent)	2-48.10
STE/ICE Test No. 14 Compression Unbalance	2-48.13
STE/ICE Test No. 24 Fuel Supply Pressure	2-48.15
STE/ICE Test No. 26 Fuel Filter Pressure Drop	2-48.16
STE/ICE Test No. 32 Air Box Pressure	2-48.17
STE/ICE (VTM Only) Test No. 50 Engine Oil Pressure (Idle)	2-48.18
STE/ICE (VTM Only) Test No. 50 Engine Oil Pressure (Engine Running)	2-48.22
STE/ICE Test No. 67 Battery Voltage (Engine Off)	2-48.27
STE/ICE Test No. 67 Battery Voltage (Engine Cranking)	2-48.28
STE/ICE Test No. 67 Battery Voltage (Engine Running)	2-48.29
STE/ICE Test No. 71 Cranking Current	2-48.31
STE/ICE Test No. 72 Current First Peak	2-48.33
STE/ICE Test No. 73 Battery Internal Resistance	2-48.34
STE/ICE Test No. 74 Starter Circuit Resistance	2-48.35
STE/ICE Test No. 75 Battery Resistance Change	2-48.36

TA312637

STE/ICE TEST TASK INDEX

TASK PAGE

STE/ICE Test No. 80
Battery Current 2-48.37

STE/ICE Test No. 82
Alternator Output Voltage (DC) 2-48.38

STE/ICE Test No. 83
Alternator Diagnostic (Field) Voltage 2-48.40

STE/ICE Test No. 84
Alternator Negative Cable Drop 2-48.42

Remove STE/ICE Test
Equipment from DCA 2-48.43

Remove STE/ICE Test
Equipment from Batteries 2-48.45

Vehicle Test Card 2-48.47

HOOK UP STE/ICE TEST EQUIPMENT TO DCA

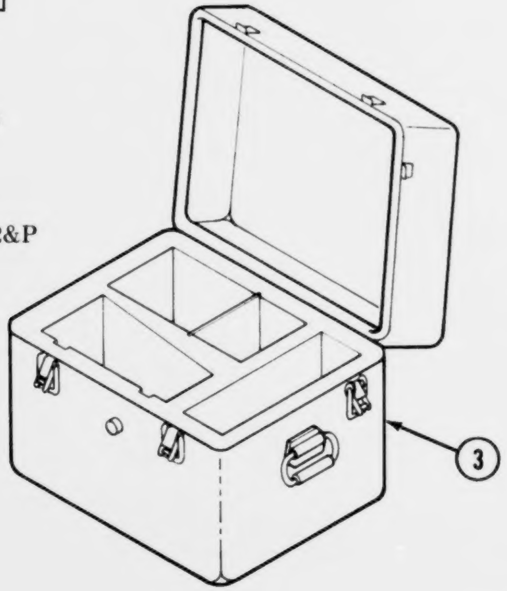
INITIAL SETUP

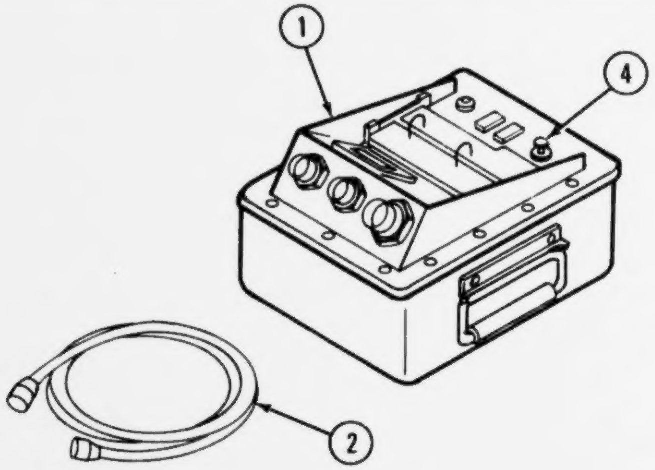
Tools:

STE/ICE test set

References:

TM 9-4910-571-12&P





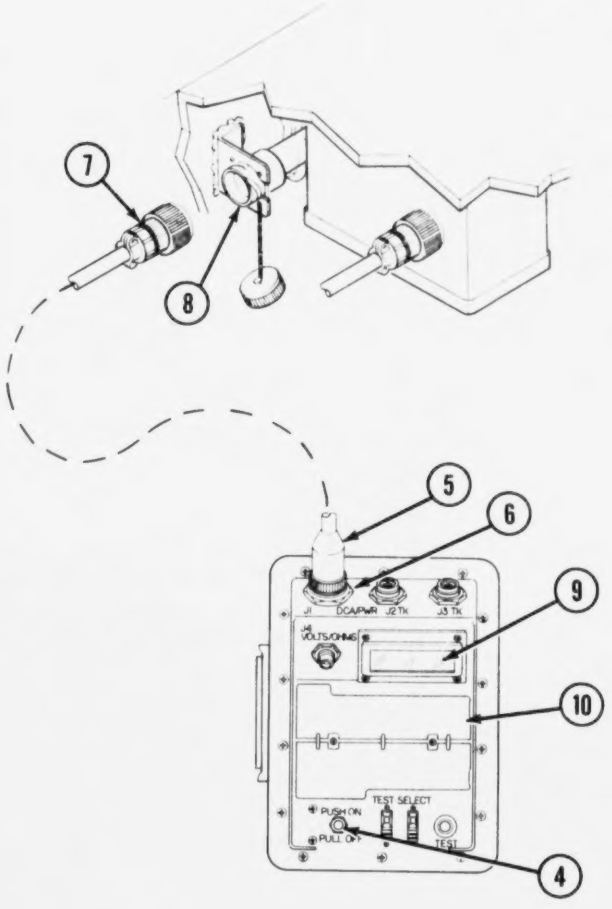
A Move STE/ICE test equipment to vehicle.

Remove VTM (1) and cable W1 (2) from transit case (3).

B Pull VTM Circuit breaker (4) up to off.

TA312638

HOOK UP STE/ICE TEST EQUIPMENT TO DCA (CONTINUED)



7
8
5
6
9
10
4
J1
DCA/PWR
J2 TK
J3 TK
VOLTS/OHMS
TEST SELECT
PUSH ON
PULL OFF
TEST

C Install plug W1P1 (5) on VTM jack J1 (6).

D Install plug W1P2 (7) to DCA connector (8) in driver's compartment.

E Push VTM circuit breaker (4) to on.

1. If display (9) shows 8888, then - - - -, go to step F.
2. If display (9) is not blank but does not show 8888 and - - - -, write up DA form 2404 on faulty VTM display. Report problem to supervisor.
3. If display (9) is blank, refer to TM 9-4910-571-12&P for troubleshooting of STE/ICE.

F Perform VTM confidence check. See operating instructions on flip cards (10). If VTM confidence test does not pass, replace STE/ICE.

G Proceed to appropriate STE/ICE test.

TA312639

HOOK UP STE/ICE TEST EQUIPMENT ON BATTERIES

INITIAL SETUP

Tools:

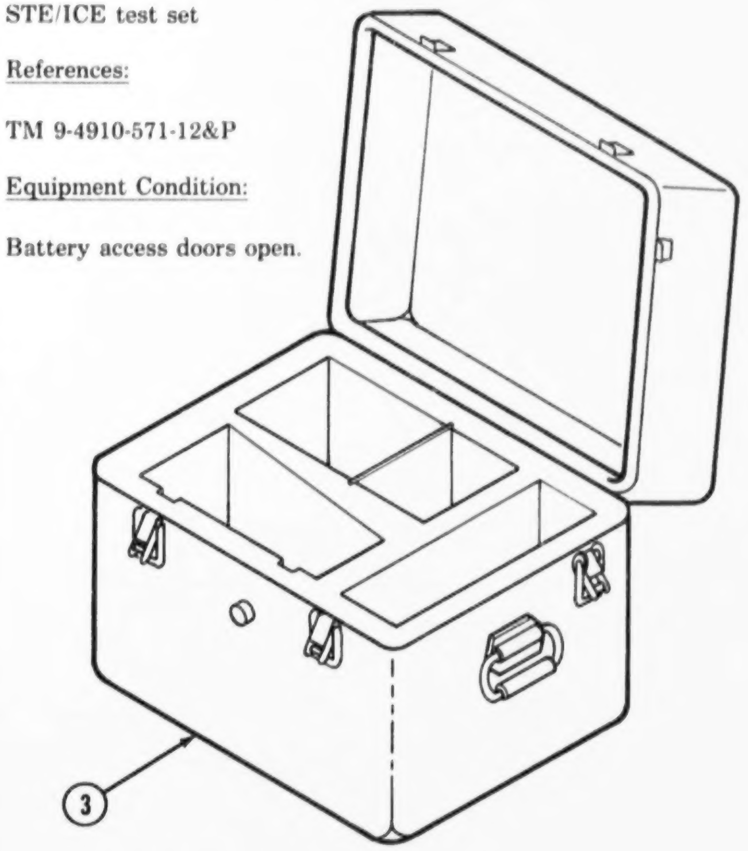
STE/ICE test set

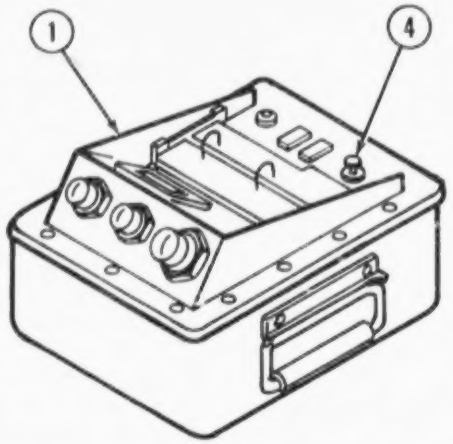
References:

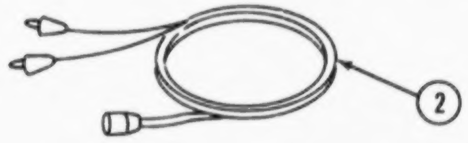
TM 9-4910-571-12&P

Equipment Condition:

Battery access doors open.







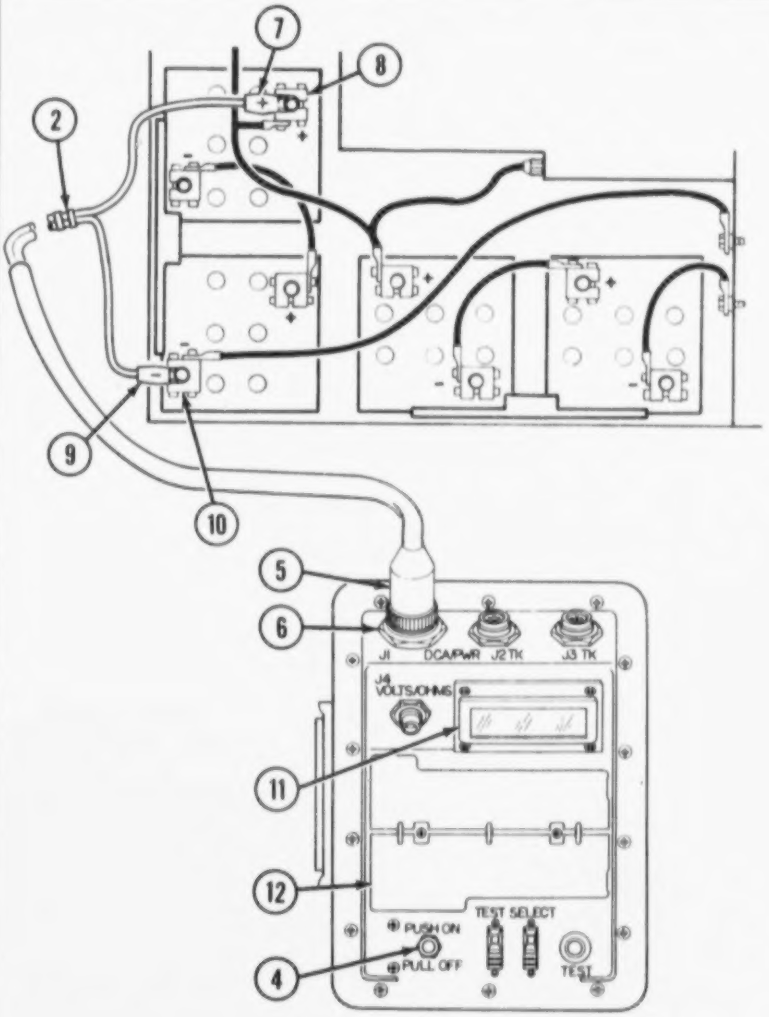
A Move STE/ICE test equipment to vehicle.

Remove VTM (1) and cable W5 (2) from transit case (3).

B Pull VTM circuit breaker (4) up to off.

TA312640

HOOK UP STE/ICE TEST EQUIPMENT ON BATTERIES (CONTINUED)


7
8
2
9
10
5
6
J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
11
12
PUSH ON
PULL OFF
TEST SELECT
TEST
4

C Install plug W5P1 (5) on VTM jack J1 (6).

D Install red lead (7) of cable W5 (2) on battery positive terminal clamp (8).

E Install black lead (9) of cable W5 (2) on battery negative terminal clamp (10).

F Push VTM circuit breaker (4) to on.

1 If display (11) shows 8888, then - - - -, go to Step G.
2 If display (11) is not blank but does not show 8888 and - - - -, write up DA form 2404 on faulty VTM display. Report problem to supervisor.
3 If display (11) is blank refer to TM 9-4910-571-12&P for troubleshooting of STE/ICE.

G Perform VTM confidence check. See operating instructions on flip cards (12). If VTM confidence check fails, replace STE/ICE.

H Proceed to appropriate STE/ICE test.

TA312641

STE/ICE TEST NO. 10 ENGINE RPM (CRANKING)

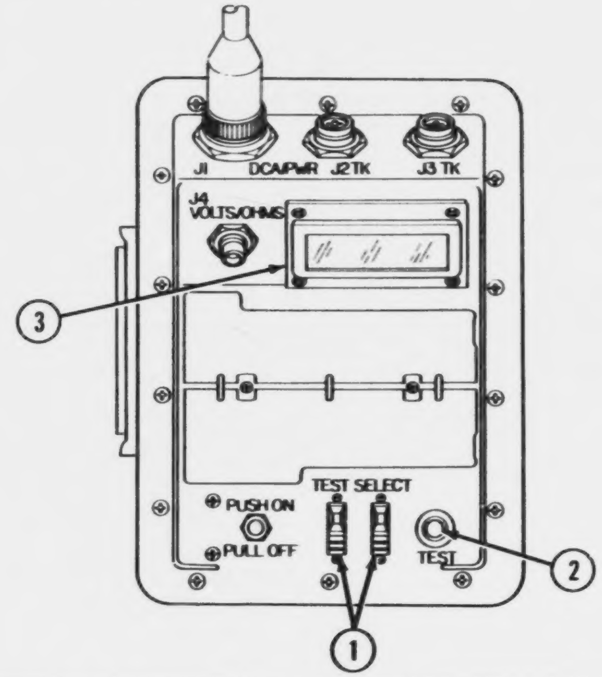
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Set engine to prevent starting. Locate and hold FUEL SHUTOFF closed.

B Dial test select (1) to 10.

C Locate and hold FUEL SHUTOFF closed while cranking engine. Engine must not start while performing this step.

D Press and release test button (2).

E Check display (3).

  1 Test No. 10 passes if display (3) shows at least 100 rpm.
  2 If display (3) shows 0, check connections and repeat test.
  3 If display (3) shows erratic reading, check connections and repeat test.

F Return to troubleshooting.

TA312642

STE/ICE TEST NO. 10 ENGINE RPM (IDLE)

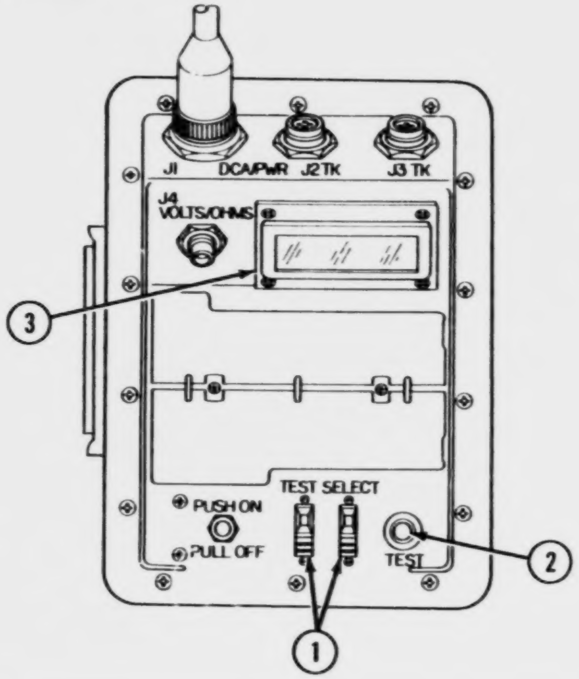
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
3
PUSH ON
PULL OFF
TEST SELECT
TEST
2
1

A Dial test select (1) to 10.

B Start engine. See TM 9-2350-267-10.

C Press and release test button (2).

D Check display (3).

1 Test No. 10 passes if display (3) shows between 550 - 600 rpm.
2 If display (3) shows 0, check connections and repeat test.
3 If display (3) shows erratic reading, check connections and repeat test.

E Stop engine. See TM 9-2350-267-10.

F Return to troubleshooting.

TA312643

STE/ICE TEST NO. 10 ENGINE RPM (GOVERNOR SPEED)

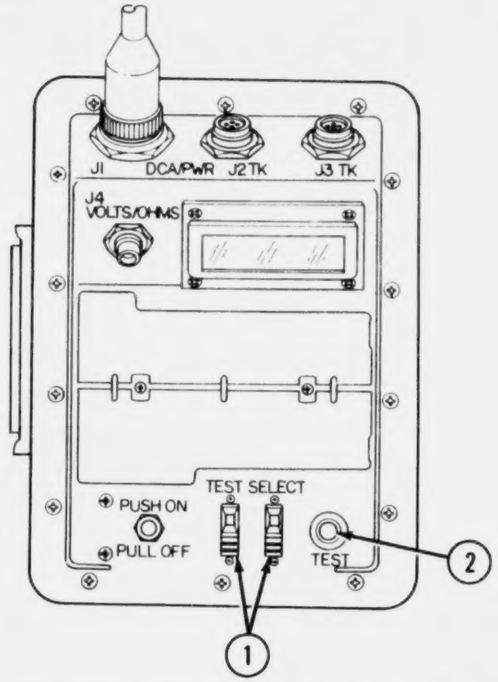
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
TEST SELECT
PUSH ON
PULL OFF
TEST
1
2

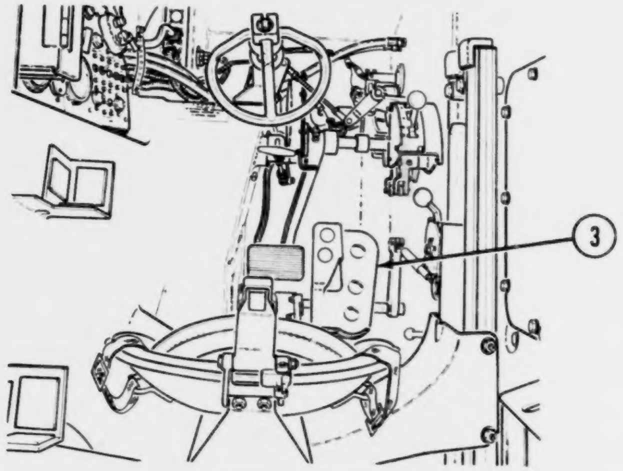
A Dial test select (1) to 10.

B Press and release test button (2).

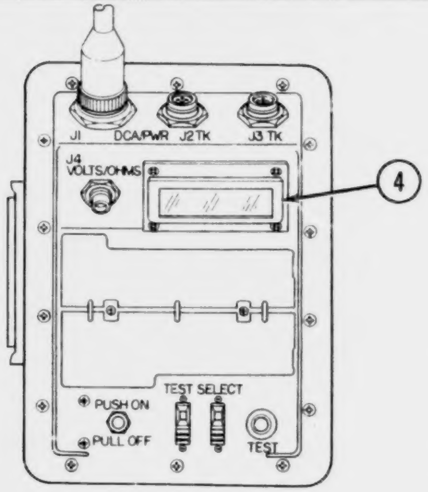
C Start engine. See TM 9-2350-267-10.

TA312644

STE/ICE TEST NO. 10 ENGINE RPM (GOVERNOR SPEED) (CONTINUED)



D Depress accelerator pedal (3) fully.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
4
PUSH ON
PULL OFF
TEST SELECT
TEST

E Check display (4).

1. Test No. 10 passes if display (4) shows between 2350 - 2500 rpm.
2. If display (4) shows 0, check connections and repeat test.
3. If display (4) shows an erratic reading, check connections and repeat test.

F Stop engine. See TM 9-2350-267-10.

G Return to troubleshooting.

TA312645

STE/ICE TEST NO. 13 POWER (PERCENT)

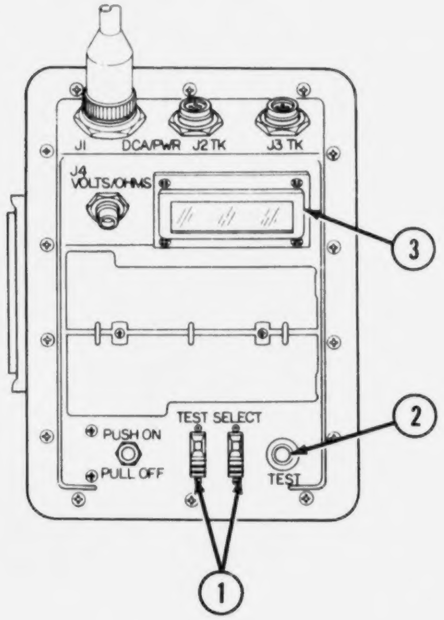
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). VTM display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). VTM display (3) will indicate 11.

E Dial test select (1) to 10.

F Start engine. See TM 9-2350-267-10.

G Press and release test button (2).

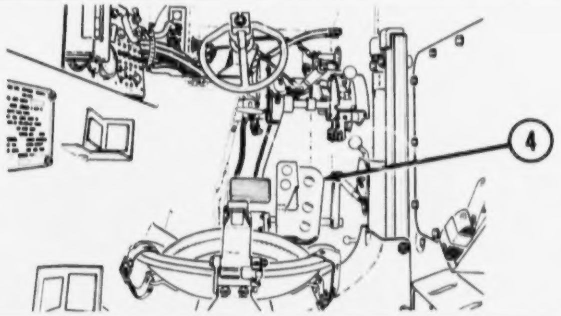
H Check display (3).

  1 If displayed value is less than 550 rpm or more than 600 rpm, adjust idle speed. See p 7-47.
  2 DO NOT run power test if idle speed cannot be properly adjusted.

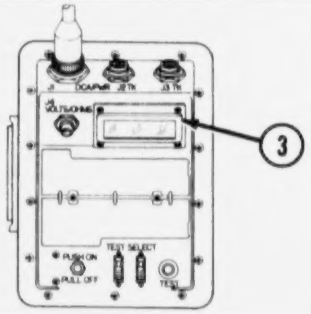
I Press and release test button (2).

TA312646

STE/ICE TEST NO. 13 POWER (PERCENT) (CONTINUED)

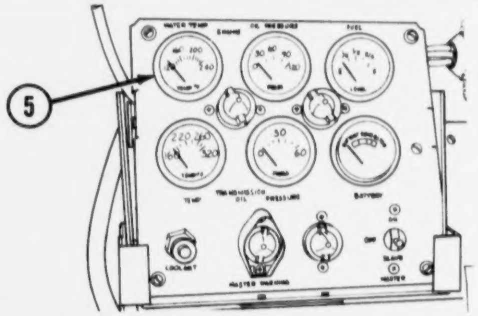


J Depress accelerator pedal (4) fully.



K Check display (3).

1 If displayed value is less than 2350 rpm or more than 2500 rpm, adjust governor speed. See p 7-46.
2 DO NOT run power test if governor speed cannot be properly adjusted.

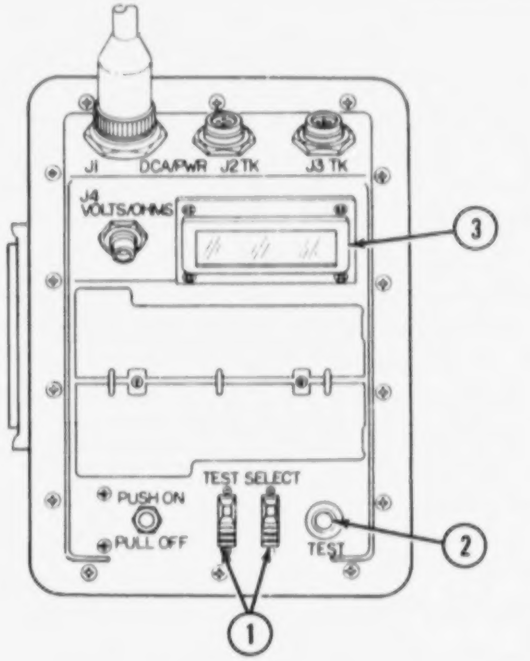


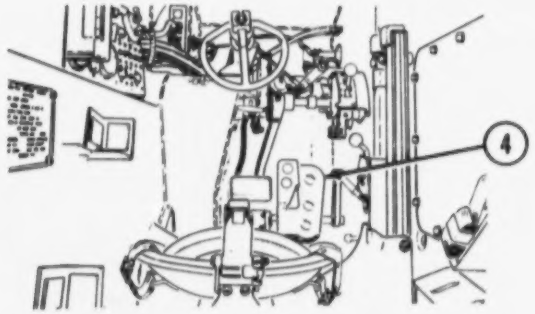
L Check engine temperature gage (5).

Power test cannot be run if engine temperature is above normal (170°F to 185°F).

TA312647

STE/ICE TEST NO. 13 POWER (PERCENT) (CONTINUED)


J1
DCA/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
3
PUSH ON
PULL OFF
TEST SELECT
TEST
2
1



M Dial test select (1) to 13.

N Press and release test button (2).

O Wait for display (3) to read CIP.

P Sharply depress accelerator pedal (4).

Q Wait for display (3) to read OFF.

R Release accelerator pedal (4).

S Check display (3).

Test No. 13 passes if display shows 60% or above.

T Stop engine. See TM 9-2350-267-10.

U Return to troubleshooting.

TA312648 ■

STE/ICE TEST NO. 14 COMPRESSION UNBALANCE

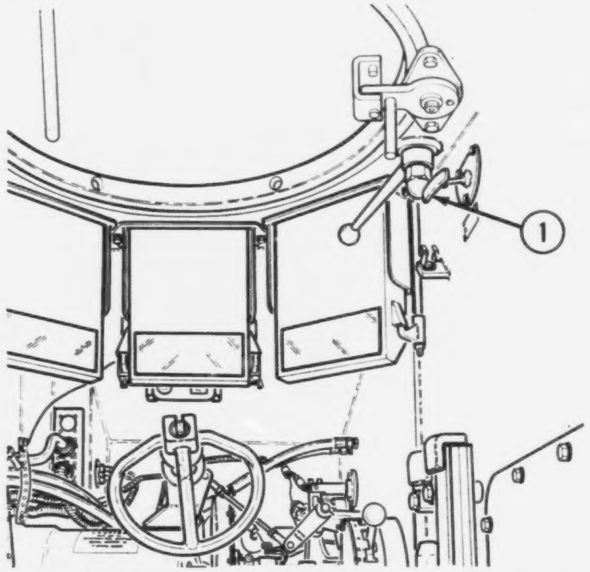
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Perform STE/ICE tests No. 72 (p 2-48.33), No. 73 (p 2-48.34), No. 74 (p 2-48.35) and No. 75 (p 2-48.36).

B Warm up engine to operating temperature (TM 9-2350-267-10).

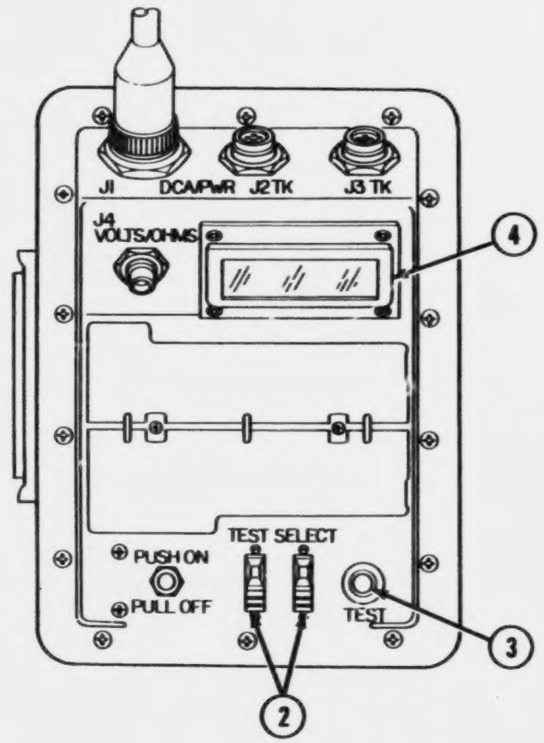
Run engine on low idle for 2 minutes before stopping.

C Set up engine to prevent starting.

Pull FUEL SHUTOFF lever (1) to OFF position.

TA312649

STE/ICE TEST NO. 14 COMPRESSION UNBALANCE (CONTINUED)


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
4
TEST SELECT
PUSH ON
PULL OFF
TEST
3
2

CAUTION

Do not run more than two compression unbalance tests in a row because vehicle batteries may discharge.

D Set test select (2) to 14.

E Press and release test button (3).

F Wait for display (4) to read GO.

G Crank engine until display (4) reads OFF.

NOTE

Display will change to - - - - while engine is turning.

H Check display (4).

Test No. 14 passes if display shows 10% or less.

I Return to troubleshooting.

TA312650

STE/ICE TEST NO. 24 FUEL SUPPLY PRESSURE

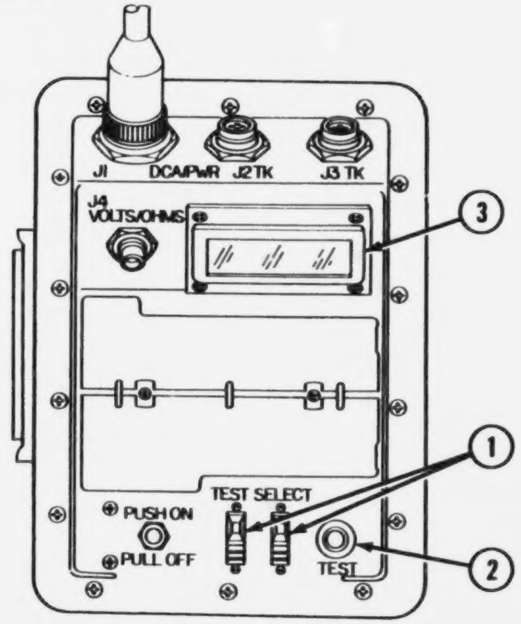
INITIAL SETUP

References:

TM 9-2350-267-10
TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 24.

F Press test button (2) until display (3) shows CAL. Release test button (2).

G Check display (3).

  1 If display (3) shows between ± 15, press and release test button (2).

  2 If display (3) shows less than − 15 or more than + 15, refer to TM 9-4910-571-12&P.

H Start engine. See TM 9-2350-267-10.

I Check display (3).

Test No. 24 passes if display (3) shows between 40-70 psig.

J Stop engine. See TM 9-2350-267-10.

K Return to troubleshooting.

TA312651

STE/ICE TEST NO. 26 FUEL FILTER PRESSURE DROP

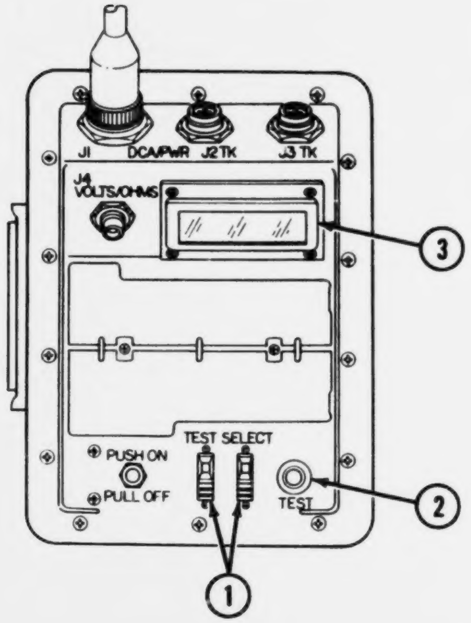
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 04.

F Press and release test button (2).

G Wait for display (3) to read PASS.

H Dial test select (1) to 26.

I Start engine. See TM 9-2350-267-10.

J Press and release test button (2).

K Check display (3).

1 Test No. 26 passes if display (3) shows PASS.
2 Test No. 26 fails if display (3) shows FAIL.

L Stop engine. See TM 9-2350-267-10.

M Return to troubleshooting.

TA312652

STE/ICE TEST NO. 32 AIR BOX PRESSURE

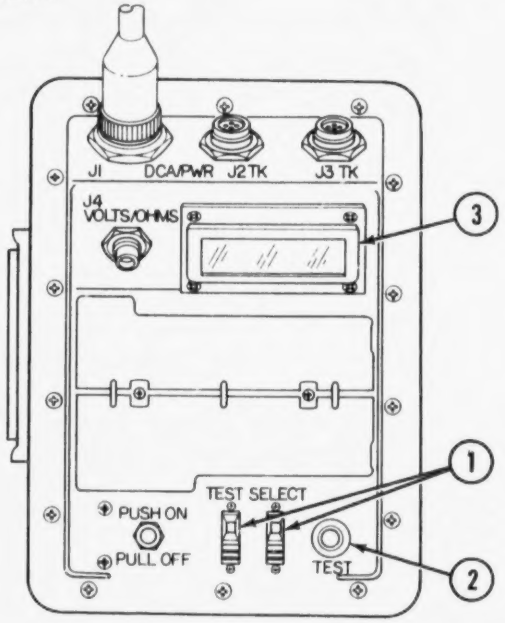
INITIAL SETUP

References:

TM 9-2350-267-10
TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 32.

F Press and hold test button (2) until display (3) shows CAL. Release test button (2).

G Check display (3).

1 If display (3) shows between ± 4, press and release test button (2).

2 If display (3) shows less than − 4 or more than + 4, refer to TM 9-4910-571-12&P.

H Start engine. See TM 9-2350-267-10. Accelerate engine to 2300 rpm.

I Check display (3).

Test No. 32 passes if display (3) shows 45-55 in. Hg.

J Stop engine. See TM 9-2350-267-10.

K Return to troubleshooting.

TA312653

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (IDLE)

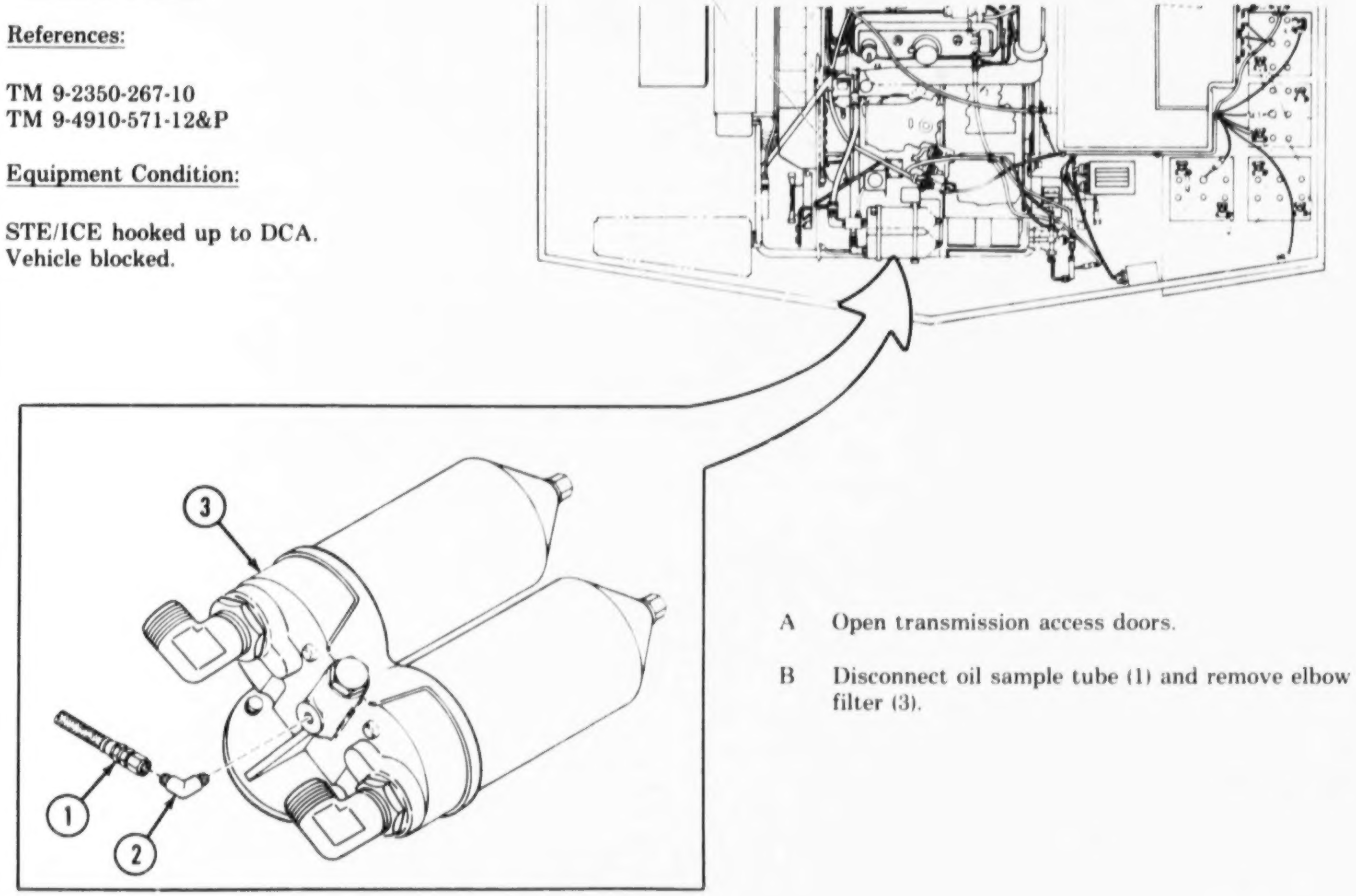
INITIAL SETUP

References:

TM 9-2350-267-10
TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.

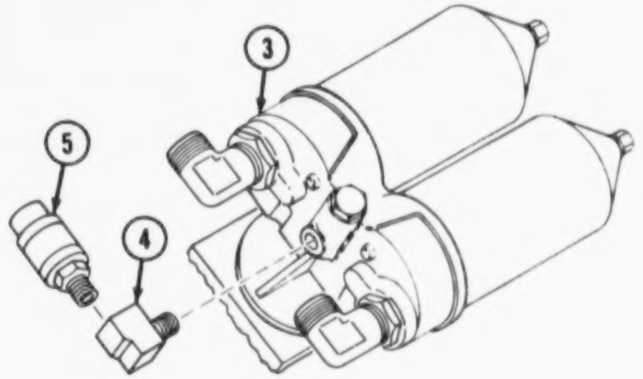


A Open transmission access doors.

B Disconnect oil sample tube (1) and remove elbow (2) from oil filter (3).

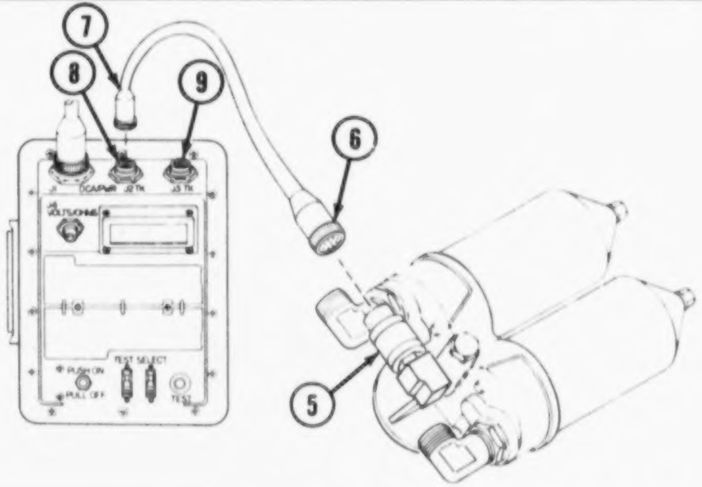
TA312654

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (IDLE) (CONTINUED)



C Install street elbow (TK item 26) (TM 9-4910-571-12&P) (4) on filter (3).

D Install blue-striped transducer (TK item 17) (TM 9-4910-571-12&P) (5) on street elbow (4).

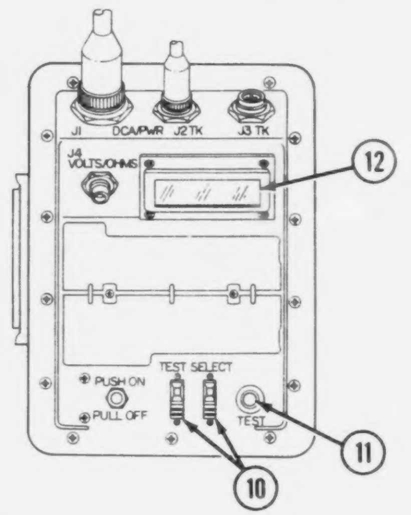


E Install plug W4P2 (6) on blue-striped transducer (5).

F Install plug W4P1 (7) on VTM jack J2 (8) or VTM jack J3 (9).

TA312655

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (IDLE) (CONTINUED)


J1
DC/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
12
PUSH ON
PULL OFF
TEST SELECT
TEST
11
10

G Dial test select (10) to 50.

H Press test button (11) until display (12) shows CAL. Release test button (11).

I Check display (12).

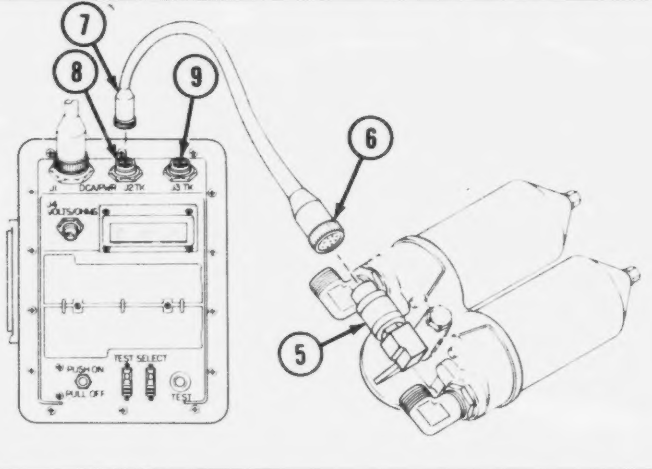
1 If display shows between ± 225, press and release test button.
2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

J Start engine. See TM 9-2350-267-10.

K Check display (12).

Test No. 50 passes if display shows 5 psi or more.

L Stop engine. See TM 9-2350-267-10.

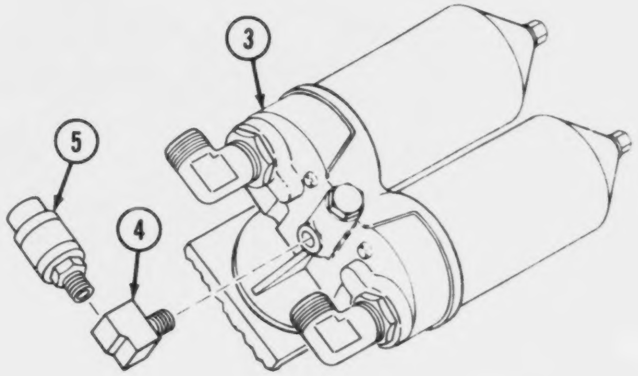

7
8
9
6
5
J1
DC/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
PUSH ON
PULL OFF
TEST SELECT
TEST

M Remove plug W4P1 (7) from VTM jack J2 (8) or VTM jack J3 (9).

N Remove plug W4P2 (6) from blue striped transducer (5).

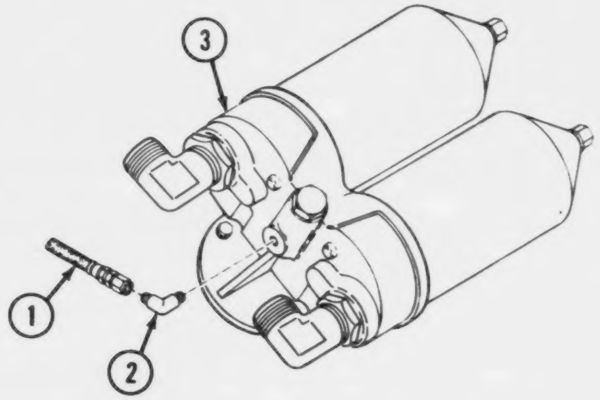
TA312656

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (IDLE) (CONTINUED)



O Remove blue-striped transducer (5) from street elbow (4).

P Remove street elbow (4) from filter (3).



Q Install elbow (2) on filter (3) and connect oil sample tube (1).

R Close transmission access doors.

S Return to troubleshooting.

TA312657

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (ENGINE RUNNING)

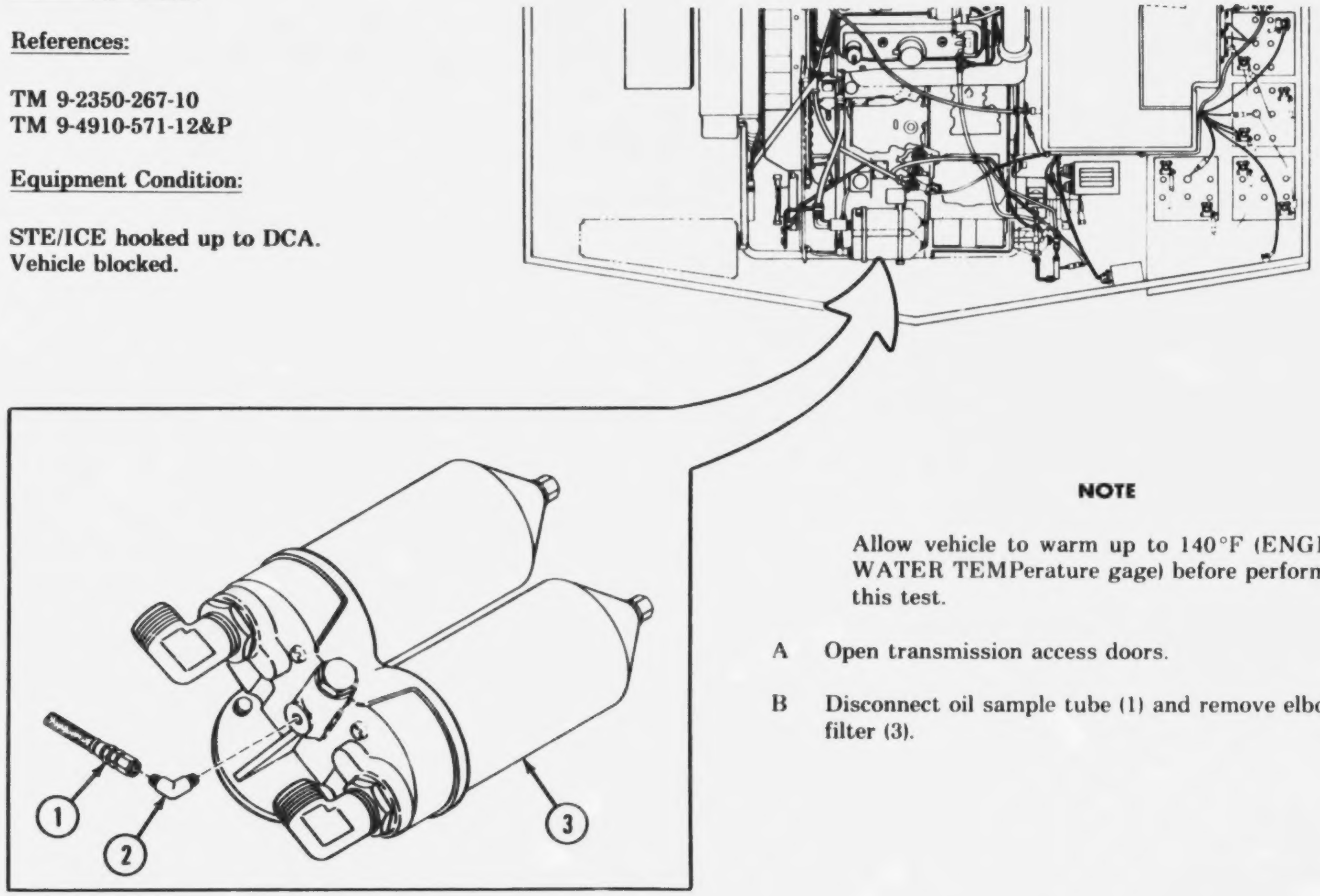
INITIAL SETUP

References:

TM 9-2350-267-10
TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



NOTE

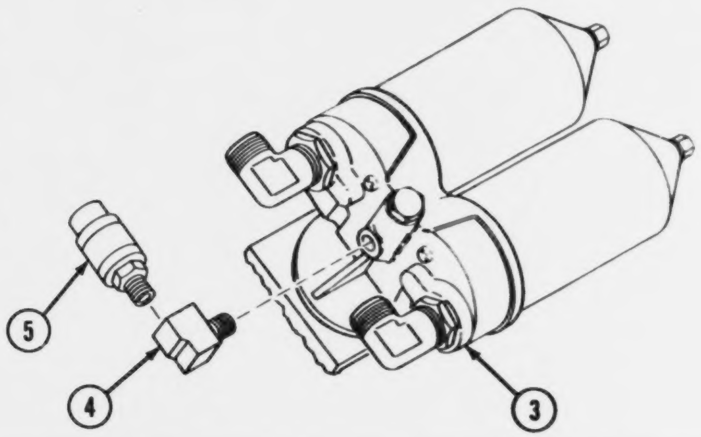
Allow vehicle to warm up to 140°F (ENGINE WATER TEMPerature gage) before performing this test.

A Open transmission access doors.

B Disconnect oil sample tube (1) and remove elbow (2) from oil filter (3).

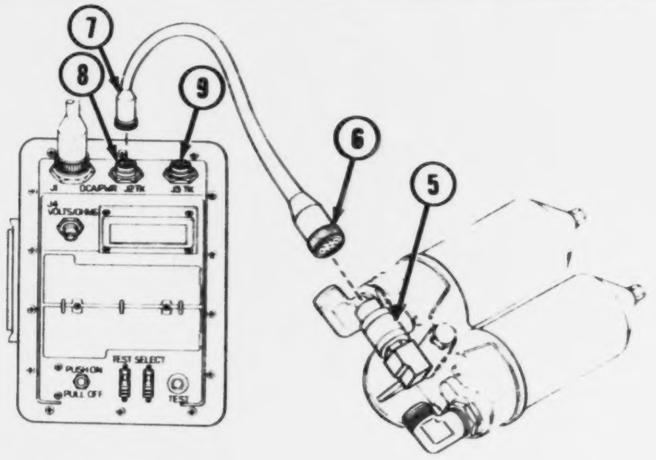
TA312658

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (ENGINE RUNNING) (CONTINUED)



C Install street elbow (TK item 26) (TM 9-4910-571-12&P) (4) on filter (3).

D Install blue-striped transducer (TK item 17) (TM 9-4910-571-12&P) (5) on street elbow (4).

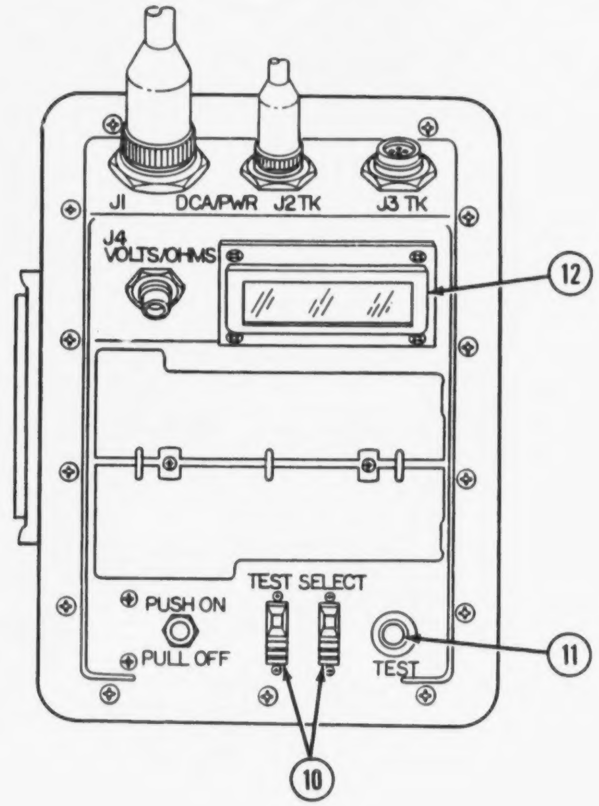

7
8
9
6
5
J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
PUSH ON
PULL OFF
TEST SELECT
TEST

E Install plug W4P2 (6) on blue-striped transducer (5).

F Install plug W4P1 (7) on VTM jack J2 (8) or VTM jack J3 (9).

TA312659

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (ENGINE RUNNING) (CONTINUED)



G Dial test select (10) to 50.

H Press test button (11) and hold until display (12) shows CAL. Release test button.

I Check display (12).

1 If display shows between ± 225, proceed to Step J.
2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

J Dial test select (10) to 01.

K Press and release test button (11).

L Wait for display (12) to read PASS.

M Dial test select (10) to 50.

N Press and release test button (11).

O Start engine. See TM 9-2350-267-10.

NOTE

Two different numbers will flash on display.

P Depress accelerator until flashing display (12) shows 1000 rpm.

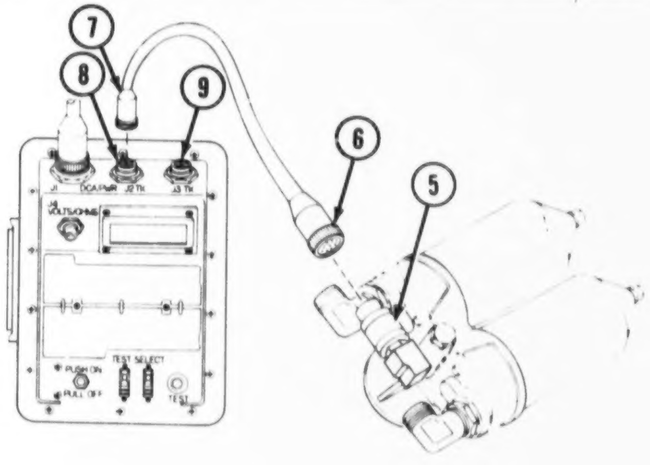
Q Check display (12).

Test No. 50 passes if display shows 30-50 psi.

R Stop engine. See TM 9-2350-267-10.

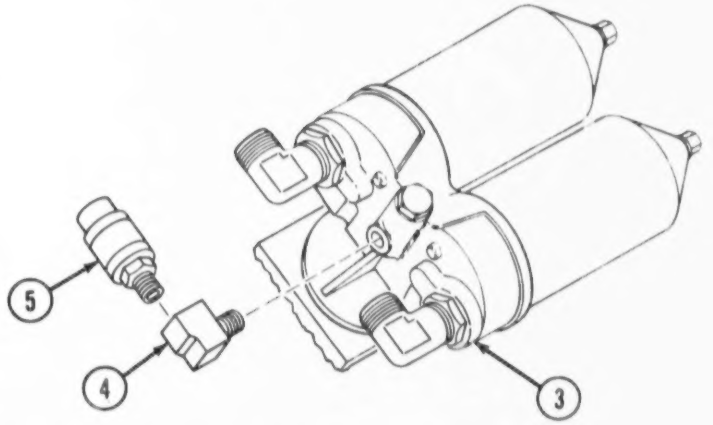
TA312660

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (ENGINE RUNNING) (CONTINUED)


7
8
9
6
5
J1
DCA PWR
J2 TK
J3 TK
VOLTS/OHMS
PUSH ON
PULL OFF
TEST SELECT
TEST

S Remove plug W4P1 (7) from VTM jack J2 (8) or VTM jack J3 (9).

T Remove plug W4P2 (6) from blue-striped transducer (5).

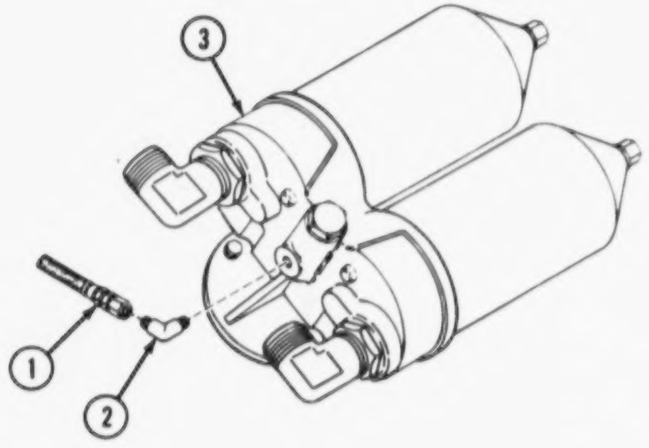


U Remove blue-striped transducer (5) from street elbow (4).

V Remove street elbow (4) from filter (3).

TA312661

STE/ICE (VTM ONLY) TEST NO. 50 ENGINE OIL PRESSURE (ENGINE RUNNING) (CONTINUED)



W Install elbow (2) on filter (3) and connect oil sample tube (1).

X Close transmission access doors.

Y Return to troubleshooting.

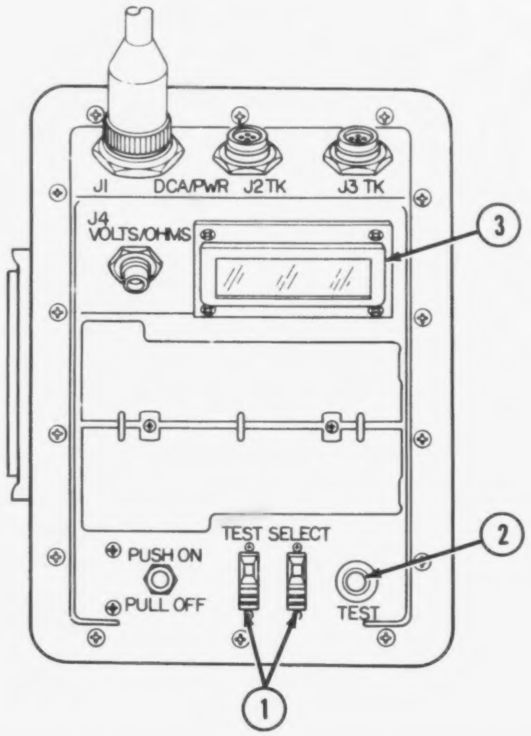
TA312662

STE/ICE TEST NO. 67 BATTERY VOLTAGE (ENGINE OFF)

INITIAL SETUP

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
3
PUSH ON
PULL OFF
TEST SELECT
TEST
2
1

A Dial test select (1) to 67.

B Press and release test button (2).

C Check display (3).

1 Test No. 67 passes if display (3) shows at least 22 volts.
2 If display (3) shows 0 volts, check vehicle electrical connections and repeat test.

D Return to troubleshooting.

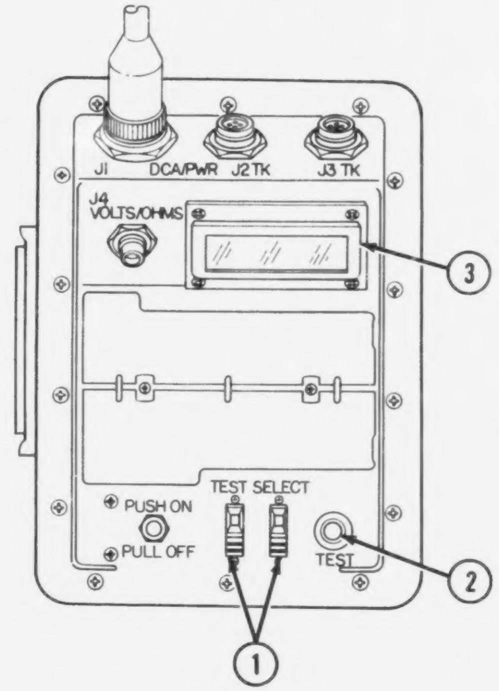
TA312663

STE/ICE TEST NO. 67 BATTERY VOLTAGE (ENGINE CRANKING)

INITIAL SETUP

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
TEST SELECT
PUSH ON
PULL OFF
TEST
3
2
1

A Set engine to prevent starting.

Locate and hold FUEL SHUTOFF in OFF position.

B Dial test select (1) to 67.

C Locate and hold FUEL SHUTOFF closed while cranking engine for 2 to 3 seconds. Engine must not start while performing this step.

D Press and release test button (2).

E Check display (3).

1 Test No. 67 passes if display (3) shows at least 18 volts.
2 If display (3) shows 0 volts, check vehicle electrical connections and repeat test.

F Return to troubleshooting.

TA312664

STE/ICE TEST NO. 67 BATTERY VOLTAGE (ENGINE RUNNING)

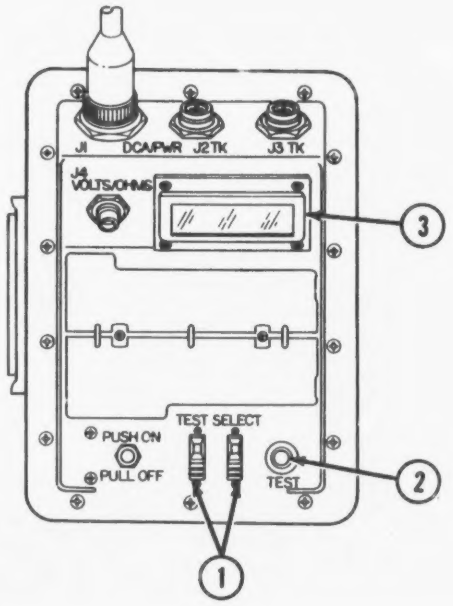
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
3
PUSH ON
PULL OFF
TEST SELECT
TEST
2
1

A Dial test select (1) to 01.

B Press and release test button (2).

C Wait for display (3) to read PASS.

D Dial test select (1) to 67.

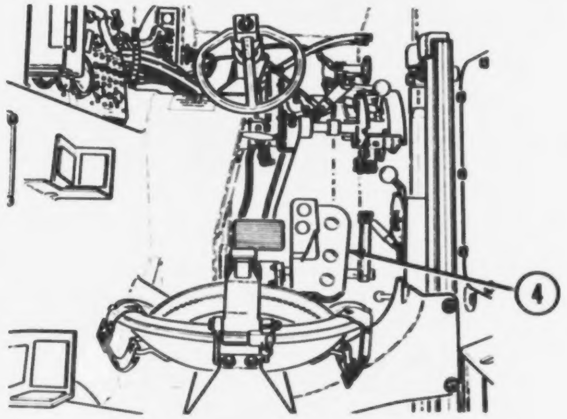
E Start engine. See TM 9-2350-267-10.

F Turn on service drive lights. See TM 9-2350-267-10.

G Press and release test button (2).

TA312665

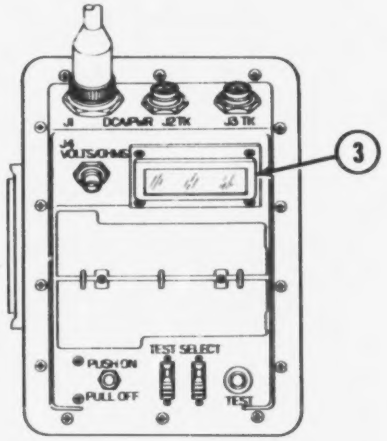
STE/ICE TEST NO. 67 BATTERY VOLTAGE (ENGINE RUNNING) (CONTINUED)



NOTE

Two different numbers will flash on display.

H Depress accelerator (4) until flashing display (3) shows 1000 to 1200 rpm.


J1
DC/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
3
TEST SELECT
PUSH ON
PULL OFF
TEST

I Check display (3).

1 Test No. 67 passes if display (3) shows 26.5 - 28.5 volts.
2 If display (3) shows 0 volts, check electrical connections and repeat test.

J Turn off service drive lights. See TM 9-2350-267-10.

K Stop engine. See TM 9-2350-267-10.

L Return to troubleshooting.

TA312666

STE/ICE TEST NO. 71 CRANKING CURRENT

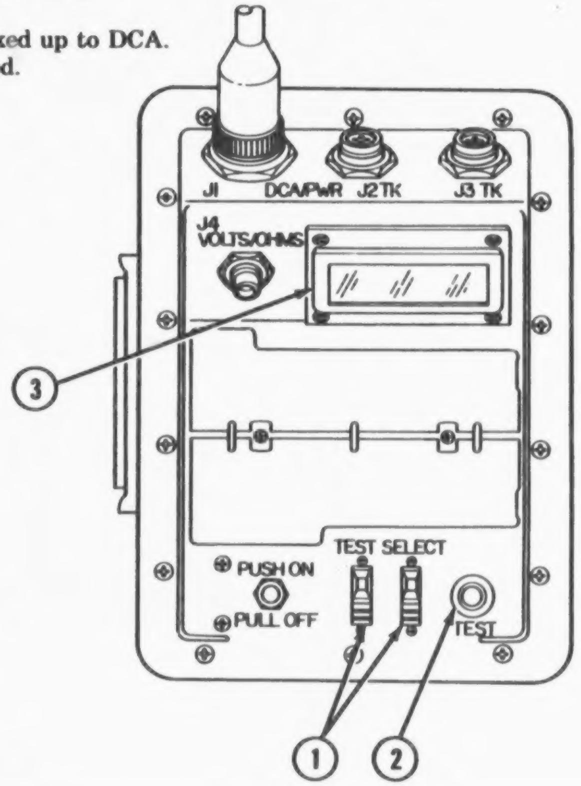
INITIAL SETUP

References:

TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
PUSH ON
PULL OFF
TEST SELECT
TEST
3
1
2

A Dial test select (1) to 71.

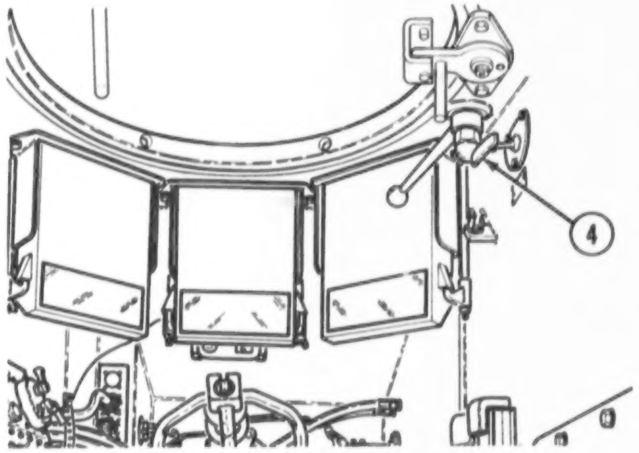
B Press test button (2) until display (3) reads CAL. Release test button (2).

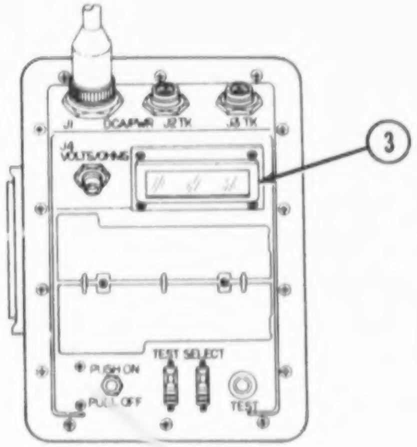
C Check display (3).

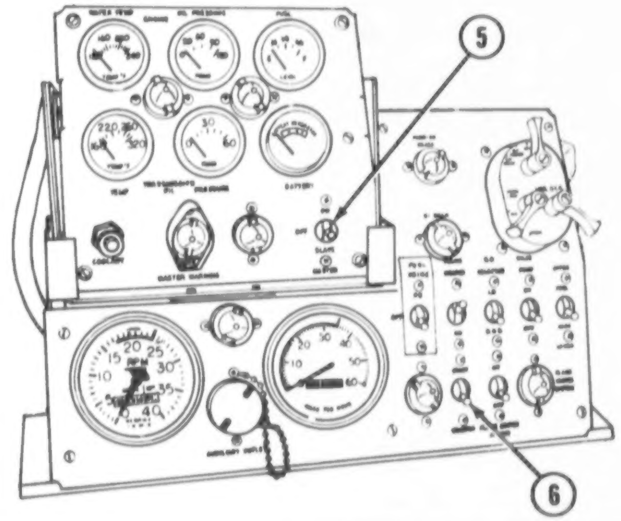
1 If display shows between ± 225, press and release test button.
2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

TA312667

STE/ICE TEST NO. 71 CRANKING CURRENT (CONTINUED)




J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
3
TEST SELECT
PUSH ON
PULL OFF
TEST



D Crank engine.

1 Pull FUEL SHUTOFF lever (4) to OFF position. Engine must not start while performing this step.
2 Set MASTER switch (5) to ON position.
3 Push and hold ENGINE STARTER switch (6) to START position for 5 - 10 seconds.

E Check display (3).

Test No. 71 passes if display reads −350 to −550 amps.

F Move MASTER switch (5) to OFF position.

G Return to troubleshooting.

TA312668

STE/ICE TEST NO. 72 CURRENT FIRST PEAK

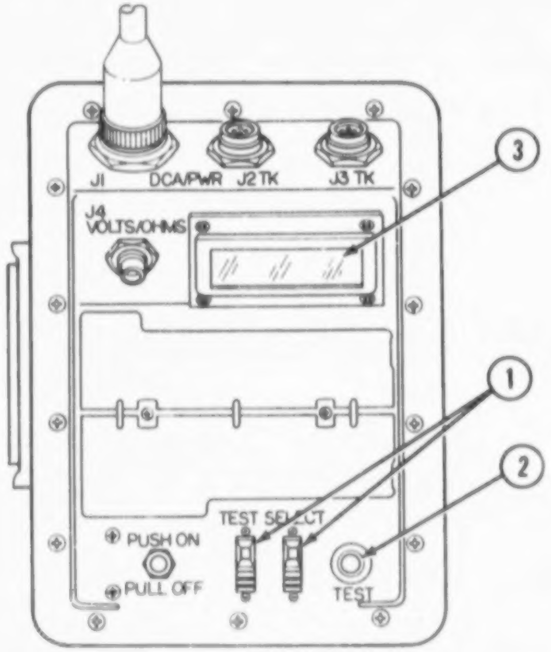
INITIAL SETUP

References:

TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
All electrical accessories turned off.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 72.

F Press test button (2) until display (3) shows CAL. Release test button (2).

G Check display (3).

  1 If display shows between ± 225, press and release test button.
  2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

H Crank engine when display (3) reads GO.

I Stop cranking engine when display (3) reads OFF.

J Check display (3).

Test No. 72 passes if display shows 875-1680 amps.

K Return to troubleshooting.

TA312669

STE/ICE TEST NO. 73 BATTERY INTERNAL RESISTANCE

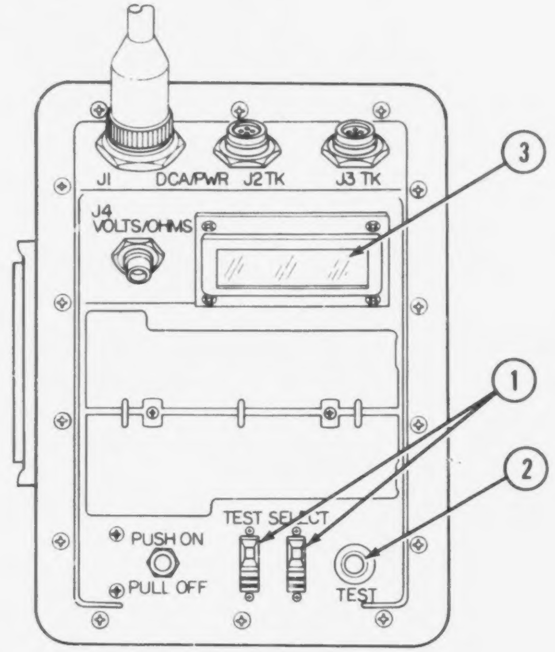
INITIAL SETUP

References:

TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
All electrical accessories turned off.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 73.

F Press test button (2) until display (3) shows CAL. Release test button (2).

G Check display (3).

  1 If display shows between ± 225, press and release test button.
  2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

H Crank engine when display (3) reads GO.

I Stop cranking engine when display (3) reads OFF.

J Check display (3).

NOTE

Display reading is given in milliohms.

Test No. 73 passes if display shows 13 milliohms or less.

K Return to troubleshooting.

TA312670

STE/ICE TEST NO. 74 STARTER CIRCUIT RESISTANCE

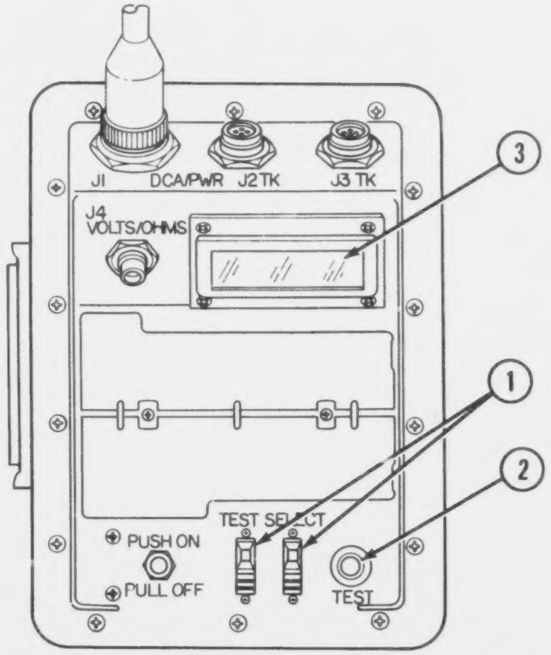
INITIAL SETUP

References:

TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
All electrical accessories turned off.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 74.

F Press test button (2) until display (3) shows CAL. Release test button (2).

G Check display (3).

  1 If display shows between ± 225, press and release test button.
  2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

H Crank engine when display (3) reads GO.

I Stop cranking engine when display (3) reads OFF.

J Check display (3).

NOTE

Display reading is given in milliohms.

Test No. 74 passes if display reads 3-25 milliohms.

K Return to troubleshooting.

TA312671

STE/ICE TEST NO. 75 BATTERY RESISTANCE CHANGE

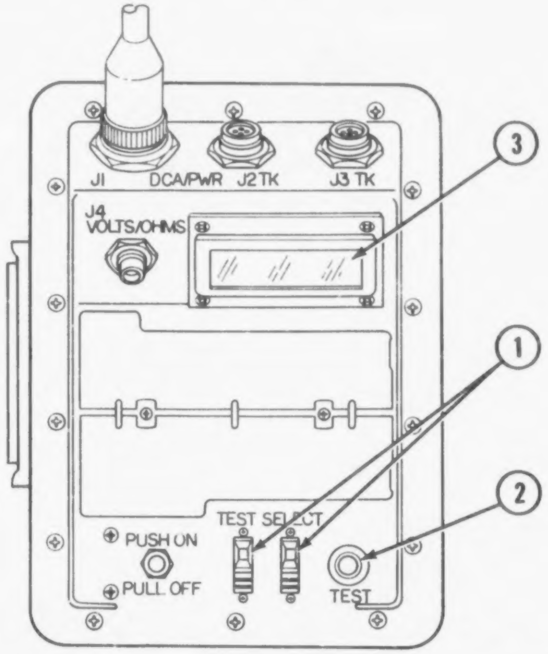
INITIAL SETUP

References:

TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
All electrical accessories turned off.
Vehicle blocked.



A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 75.

F Press test button (2) until display (3) shows CAL. Release test button (2).

G Check display (3).

  1 If display shows between ± 225, press and release test button.
  2 If display shows less than − 225 or more than + 225, refer to TM 9-4910-571-12&P.

H Crank engine when display (3) reads GO.

I Stop cranking engine when display (3) reads OFF.

J Check display (3).

NOTE

Display reading is given in milliohms/second.

Test No. 75 passes if display reads 50 milliohms/second or less.

K Return to troubleshooting.

TA312672

STE/ICE TEST NO. 80 BATTERY CURRENT (CHARGING)

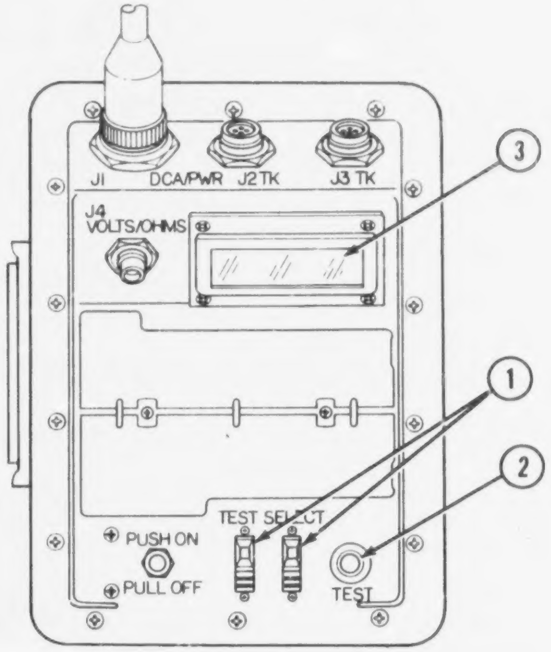
INITIAL SETUP

References:

TM 9-2350-267-10
TM 9-4910-571-12&P

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



A Dial test select (1) to 80.

B Press test button (2) until display (3) shows CAL. Release test button.

1 If display (3) shows between ± 225, press and release test button (2).
2 f display (3) shows less than – 225 or more than + 225, refer to TM 9-4910-571-12&P.

C Dial test select (1) to 02.

D Press and release test button (2).

E Wait for display (3) to show PASS.

F Dial test select (1) to 80.

G Press and release test button (2).

H Start engine. Refer to TM 9-2350-267-10.

I Check display (3).

Test No. 80 passes if display (3) shows 8-100 amps.

J Stop engine. See TM 9-2350-267-10.

K Return to troubleshooting.

TA312673

STE/ICE TEST NO. 82 ALTERNATOR OUTPUT VOLTAGE (DC)

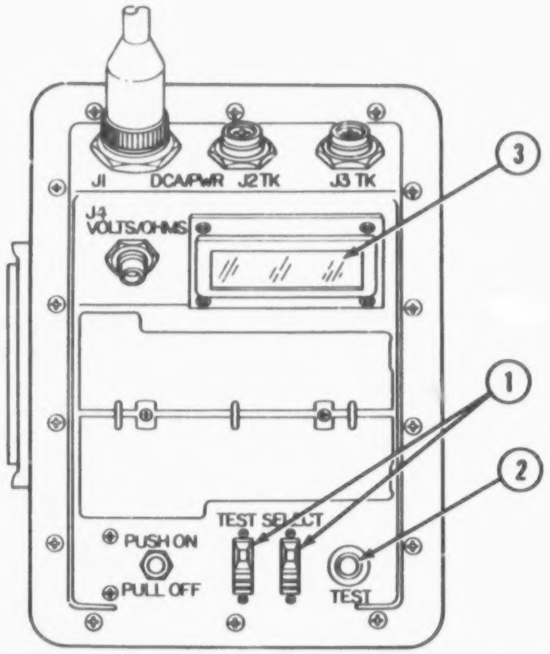
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.



NOTE

Test must be conducted with fully charged batteries.

A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 01.

F Press and release test button (2).

G Wait for display (3) to read PASS.

H Dial test select (1) to 82.

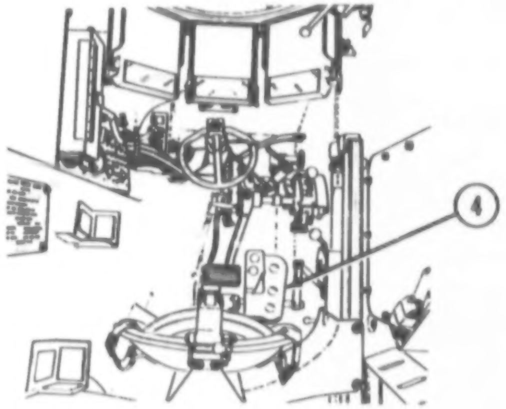
I Start engine. See TM 9-23560-267-10.

J Press and release test button (2).

K Turn on service drive lights. See TM 9-2350-267-10.

TA312674

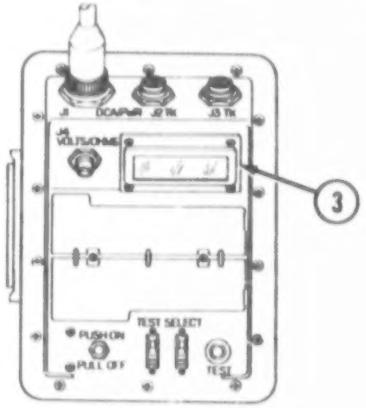
STE/ICE TEST NO. 82 ALTERNATOR OUTPUT VOLTAGE (DC) (CONTINUED)



NOTE

Two different numbers will flash on display.

L Depress accelerator (4) until flashing display (3) shows 1000 to 1200 rpm.


J1
DCA/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
TEST SELECT
PUSH ON
PULL OFF
TEST
3

M Check display (3).

1 Test No. 82 passes if display (3) shows between 27.5-28.5 VDC.
2 If display (3) shows 0 volts, check vehicle electrical connections and repeat test.

N Turn off service drive lights. See TM 9-2350-267-10.

O Stop engine. See TM 9-2350-267-10.

P Return to troubleshooting.

TA312675

STE/ICE TEST NO. 83 ALTERNATOR DIAGNOSTIC (FIELD) VOLTAGE

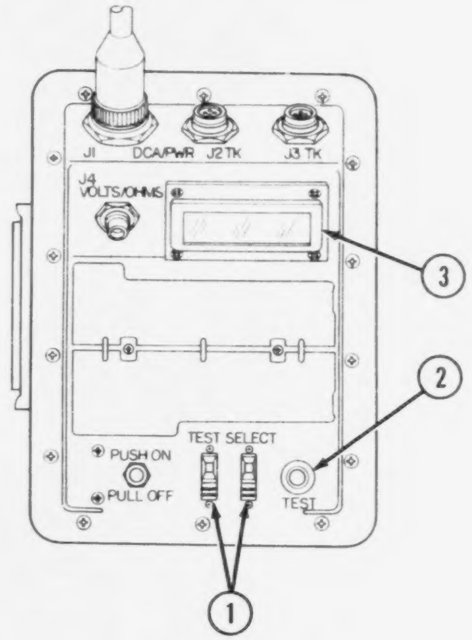
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
3
2
PUSH ON
PULL OFF
TEST SELECT
TEST
1

A Dial test select (1) to 60.

B Press and release test button (2). Display (3) will indicate VEH.

C Dial test select (1) to 11.

D Press and release test button (2). Display (3) will indicate 11.

E Dial test select (1) to 01.

F Press and release test button (2).

G Wait for display (3) to read PASS.

H Dial test select (1) to 83.

I Start engine. See TM 9-23560-267-10.

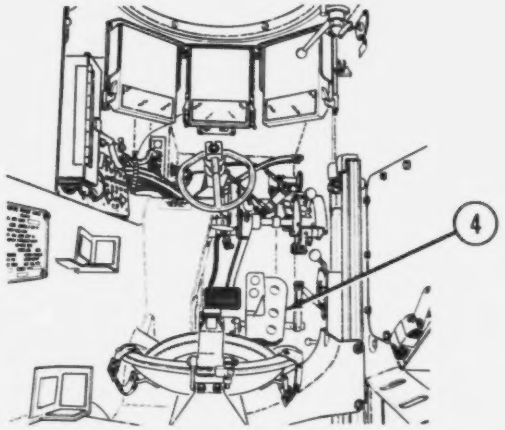
J Press and release test button (2).

K Turn on service drive lights. See TM 9-2350-267-10.

TA312676

best copy available

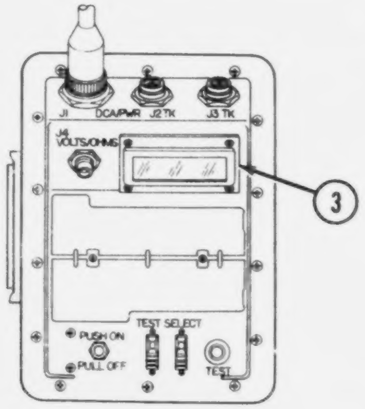
STE/ICE TEST NO. 83 ALTERNATOR DIAGNOSTIC (FIELD) VOLTAGE (CONTINUED)



NOTE

Two different numbers will flash on display.

L Depress accelerator (4) until flashing display (3) shows 1000 to 1200 rpm.


J1
DCA/PWR
J2TK
J3TK
J4 VOLTS/OHMS
3
PUSH ON
PULL OFF
TEST SELECT
TEST

M Check display (3).

1 Test No. 83 passes if display (3) shows between 6-28 volts.
2 If display (3) shows 0 volts, check vehicle electrical connections and repeat test.

N Turn off service drive lights. See TM 9-2350-267-10.

O Stop engine. See TM 9-2350-267-10.

P Return to troubleshooting.

TA312677

STE/ICE TEST NO. 84 ALTERNATOR NEGATIVE CABLE VOLTAGE DROP

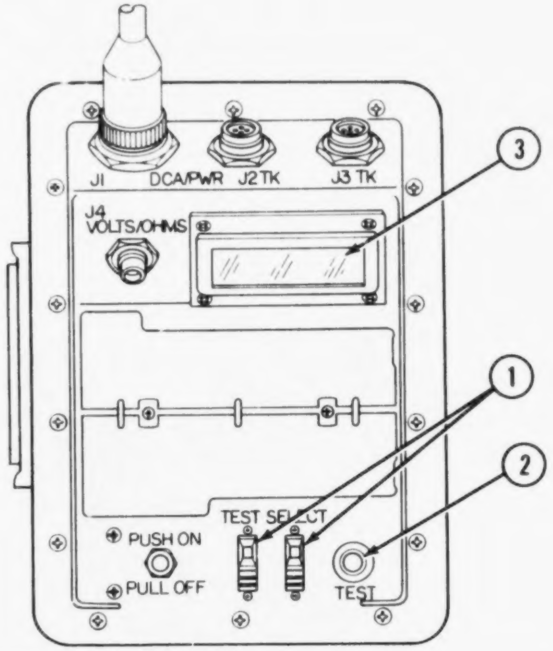
INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

STE/ICE hooked up to DCA.
Vehicle blocked.


J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
3
1
2
TEST SELECT
PUSH ON
PULL OFF
TEST

A Dial test select (1) to 84.

B Start engine. See TM 9-2350-267-10.

C Press and release test button (2).

D Check display (3).

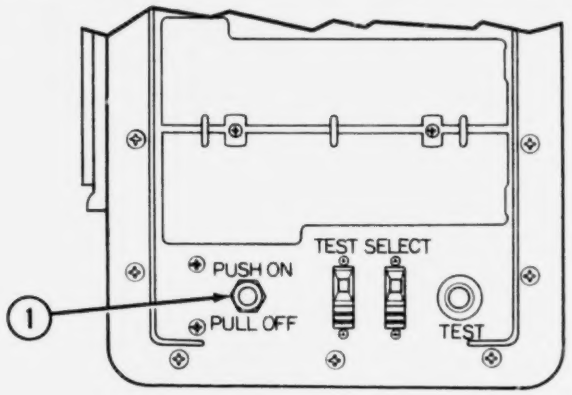
Test No. 84 passes if display (3) shows between .01-.48 VDC.

E Stop engine. See TM 9-23560-267-10.

F Return to troubleshooting.

TA312678

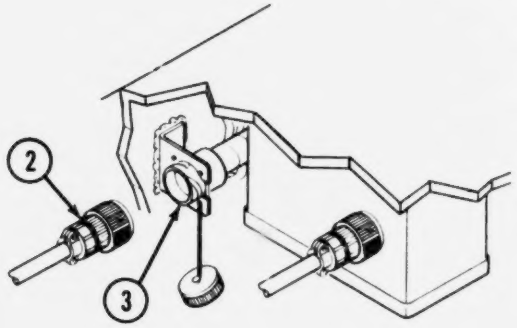
REMOVE STE/ICE TEST EQUIPMENT FROM DCA


TEST SELECT
PUSH ON
1
PULL OFF
TEST

NOTE

Do the following steps after STE/ICE tests or measurements are completed.

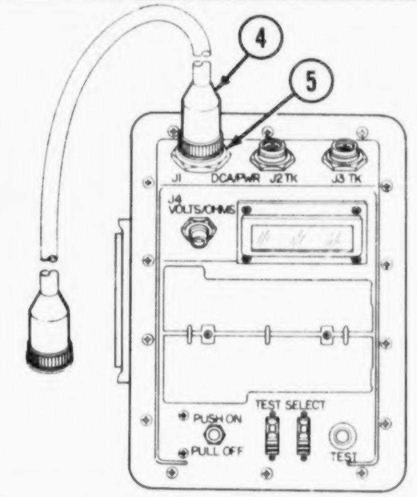
A Pull VTM circuit breaker (1) up to off.



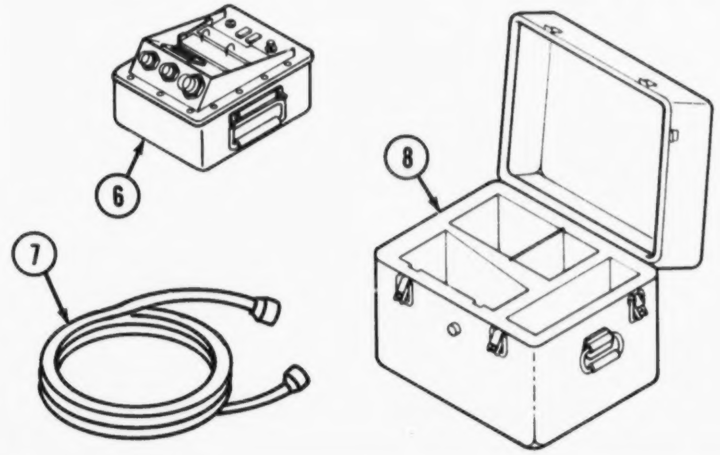
B Remove plug W1P2 (2) from DCA connector (3) in driver's compartment.

TA312679

REMOVE STE/ICE TEST EQUIPMENT FROM DCA (CONTINUED)


4
5
J1
DCA/PWR
J2 TK
J3 TK
J4
VOLTS/OHMS
TEST SELECT
PUSH ON
PULL OFF
TEST

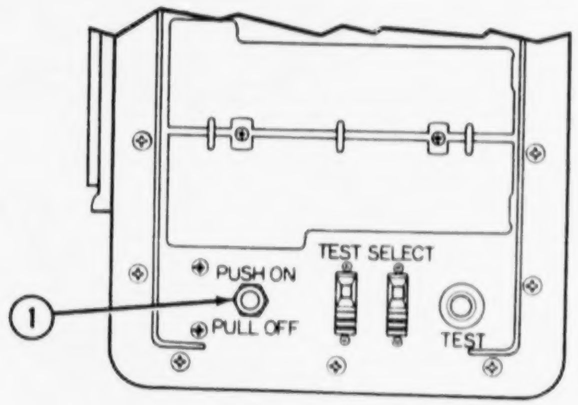
C Remove plug W1P1 (4) from VTM jack J1 (5).



D Stow VTM (6) and cable W1 (7) in transit case (8).

TA312680

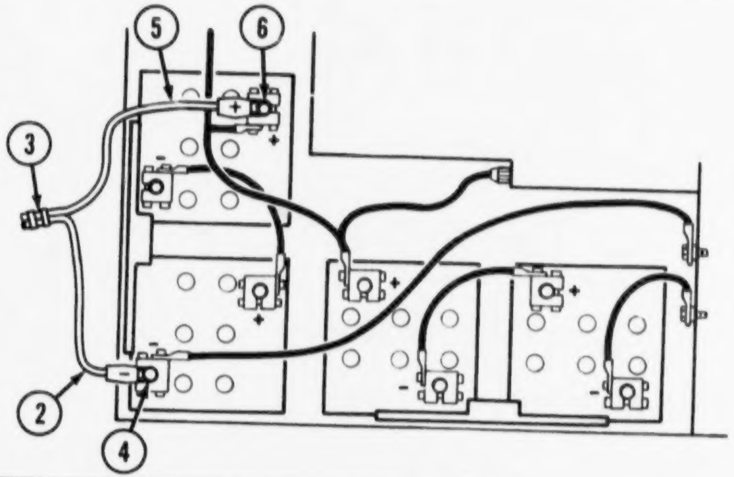
REMOVE STE/ICE TEST EQUIPMENT FROM BATTERIES


TEST SELECT
PUSH ON
1
PULL OFF
TEST

NOTE

Do the following steps after STE/ICE tests or measurements are completed.

A Pull VTM circuit breaker (1) up to off.

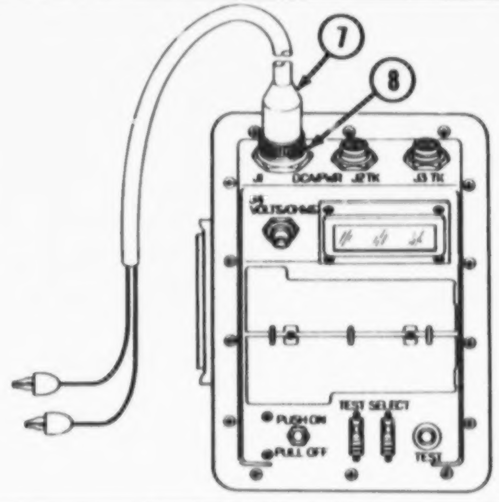


B Remove black lead (2) of cable W5 (3) from battery negative terminal clamp (4).

C Remove red lead (5) of cable W5 (3) from battery positive terminal clamp (6).

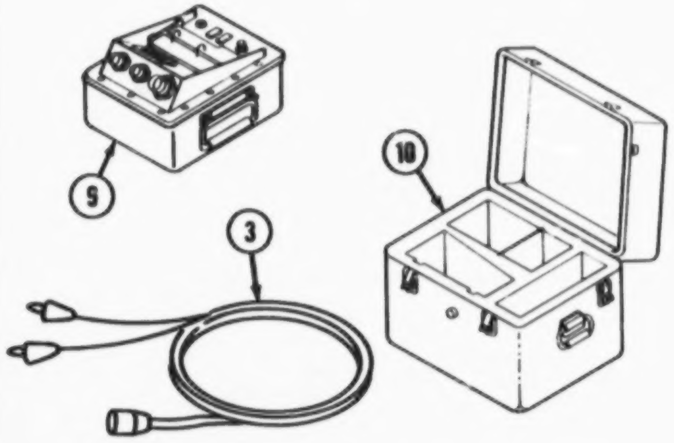
TA312681

REMOVE STE/ICE TEST EQUIPMENT FROM BATTERIES (CONTINUED)


7
8
J1
DC/PWR
J2 TK
J3 TK
J4 VOLTS/OHMS
PUSH ON
PULL OFF
TEST SELECT
TEST

D Close battery access doors.

E Remove plug W5P1 (7) from VTM jack J1 (8).



F Stow VTM (9) and cable W5 (3) in transit case (10).

TA312682

M992 VEHICLE TEST CARD - VID 11

PRE-TEST INSPECTION	POWERING UP VTM	
	DCA MODE	TK MODE (USED WHEN DCA IS INOPERABLE OR NOT APPLICABLE TO TEST)
1. Oil Level 2. Coolant Level 3. Fuel Level 4. Battery Electrolyte Level	1. Connect DCA Cable W1 to VTM Fig 1. 2. Connect DCA CABLE W1 to Vehicle DCA Connector Fig 2. 3. Perform Confidence Test 66/99. 4. Enter vehicle VID Number using Test 60.	1. Connect VTM to Cable W5 Fig 3. 2. Connect Cable W5 to Batteries Fig 4. 3. Perform Confidence Test 66/99. 4. Enter vehicle VID Number 11 using Test 60. (See Note.)

Be sure to keep a log on all performance parameters. This will be your best indication of system deterioration to failure.

NOTE: When using TK mode, remove DCA Transducers as required to install STE-ICE Kit Transducers.

MEASUREMENT NAME	DCA VTM TEST NOS.	VTM OFFSET LIMITS	OPERATING CONDITION	TK VTM TEST NOS.	SPECIAL TK CONNECTION REQUIRED	LIMITS		UNITS
						MIN	MAX	
Battery Voltage	67	—	Engine Off	67	Fig 4	22	—	Volts
Current First Peak	72	+ 225	Crank on Go	72	Fig 4	875	1680	Amps
Vehicle Gage Oil Pressure	—	—	Idle	50	Fig 5	5	—	PSI
Charging Voltage	01, 67	—	Lights & Acc on 1000-1200 RPM	01, 67	Fig 5	26.5	28.5	Volts
Vehicle Gage Cool Temp	—	—	Warm Engine	—	—	170	185	°F
Vehicle Gage Oil Pressure	—	—	At 1000 RPM	01, 50	Fig 5	30	50	PSI
Engine RPM Average	10	—	Idle	10	Fig 5	550	600	RPM
Engine RPM Average	10	—	Governor	10	Fig 5	2350	2500	RPM
Power	13	—	Warm Engine	13	Fig 5	60*	—	%
Compression Unbalance	14	—	Warm Engine Crank on Go	14	—	—	10	%
Cranking RPM	10	—	Cranking	10	Fig 5	100	—	RPM
Cranking Voltage	67	—	Cranking	67	Fig 4	18	—	Volts
Cranking Current	71	± 225	Cranking	90	Fig 4	– 350	– 550	Amps
Battery Pack Internal Resistance	73	± 225	Crank on Go	73	Fig 4	—	13	Milliohms
Starter Circuit Resistance	74	± 225	Crank on Go	74	Fig 4	3	25	Milliohms
Battery Pack Resistance Change	75	± 225	Crank on Go	75	Fig 4	—	50	Milliohms/sec

* Typical power % for an engine with a turbocharger and fuel limiting device is 68. If power % falls below 60, investigate further.

TA312683

M992 VEHICLE TEST CARD — VID 11 ADDITIONAL TEST CONNECTIONS

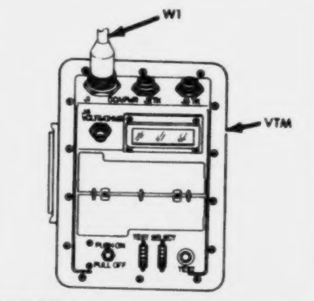


FIGURE 1. DCA CABLE W1 TO VTM

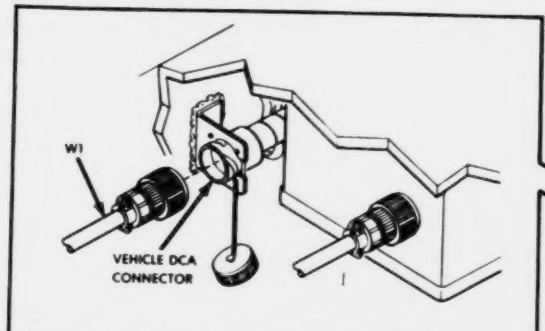
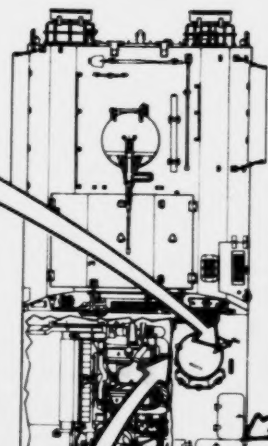

W1
VEHICLE DCA CONNECTOR

FIGURE 2. DCA CABLE W1 TO VEHICLE DCA CONNECTOR



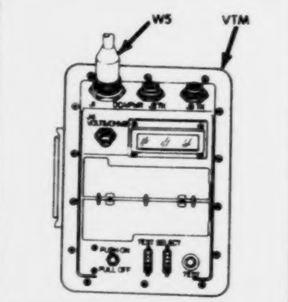
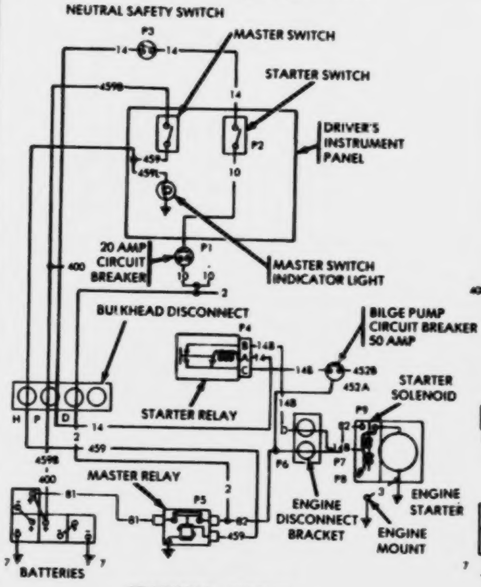
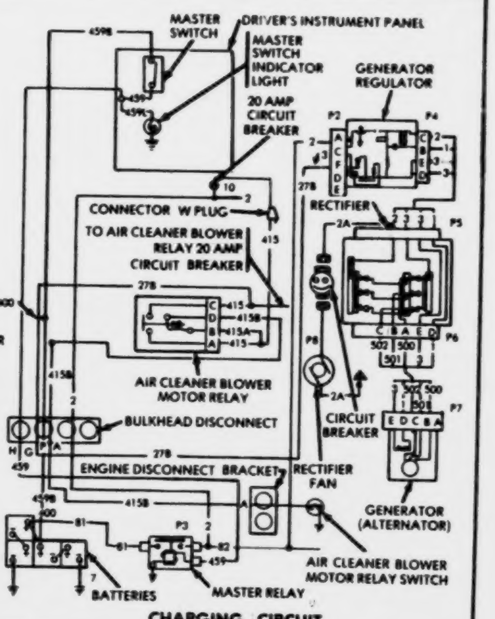


FIGURE 3. VTM TO CABLE W5

STARTING/CHARGING CIRCUIT DIAGRAMS


NEUTRAL SAFETY SWITCH
P3
14
MASTER SWITCH
STARTER SWITCH
459B
14
DRIVER'S INSTRUMENT PANEL
P2
459
459L
10
20 AMP CIRCUIT BREAKER
P1
10
10
2
400
MASTER SWITCH INDICATOR LIGHT
BULKHEAD DISCONNECT
P4
B
A
C
14B
14
BILGE PUMP CIRCUIT BREAKER 50 AMP
452B
452A
STARTER SOLENOID
STARTER RELAY
H
P
D
14
2
459
459B
400
P9
82
P6
P7
P8
MASTER RELAY
81
P5
2
82
459
ENGINE DISCONNECT BRACKET
3
ENGINE STARTER
ENGINE MOUNT
7
BATTERIES

STARTING CIRCUIT


459B
MASTER SWITCH
DRIVER'S INSTRUMENT PANEL
MASTER SWITCH INDICATOR LIGHT
459
459L
20 AMP CIRCUIT BREAKER
GENERATOR REGULATOR
P2
P4
A
C
F
D
E
C
B
E
D
2
3
1
27B
10
2
CONNECTOR W PLUG
RECTIFIER
415
TO AIR CLEANER BLOWER RELAY 20 AMP CIRCUIT BREAKER
2A
P5
27B
400
C
D
B
A
415
415B
415A
415
P6
502
500
501
415B
2
AIR CLEANER BLOWER MOTOR RELAY
P8
2A
CIRCUIT BREAKER
P7
E D C B A
BULKHEAD DISCONNECT
H
G
P
A
459
27B
ENGINE DISCONNECT BRACKET
RECTIFIER FAN
459B
400
415B
81
P3
2
82
459
GENERATOR (ALTERNATOR)
AIR CLEANER BLOWER MOTOR RELAY SWITCH
7
BATTERIES
MASTER RELAY

CHARGING CIRCUIT

Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. If test limits are different, use vehicle TM's specifications.

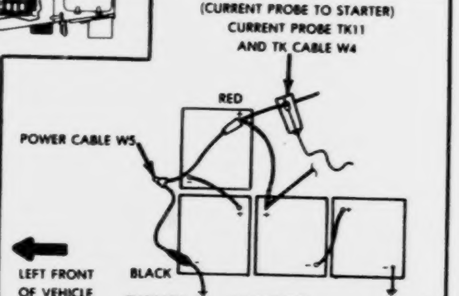

(CURRENT PROBE TO STARTER)
CURRENT PROBE TK11
AND TK CABLE W4
RED
POWER CABLE W5
LEFT FRONT OF VEHICLE
BLACK

FIGURE 4. TK MODE

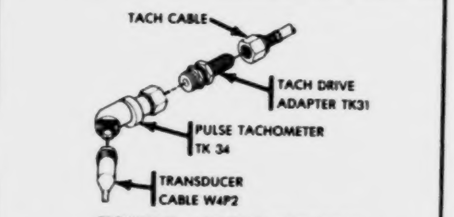

TACH CABLE
TACH DRIVE ADAPTER TK31
PULSE TACHOMETER TK 34
TRANSDUCER CABLE W4P2

FIGURE 5. TK TACH HOOK UP

TA312684

Section V TROUBLESHOOTING

GENERAL

This section contains troubleshooting, testing and repair information to fix the M992 vehicle. Make sure the problem is real. Be sure electrical or hydraulic power is ON when it is needed. Use the Quick Guide to Troubleshooting (p 2-51) and the Troubleshooting Charts (p 2-61) by following the instructions below.

WARNING

Remove all jewelry and wristwatches before working on electrical circuits.

NOTE

Proper operation of electrical components requires proper grounding. In all troubleshooting procedures of components which depend on screws or physical contact for their electrical ground, use jumper wire connected between the component and the hull to check component operation. If component then operates, a faulty ground is indicated. Clean ground contact surfaces and tighten screws, or repair/replace ground wires found to be defective.

NOTE

If the problem is not listed or if you are unable to correct it, notify Support Maintenance.

ELECTRICAL CHECKS AND TESTS

A TM 9-4910-571-12&P provides instructions for operation and use of Simplified Test Equipment/Internal Combustion Engines (STE/ICE) during vehicle testing.

B A Vehicle Test Card for use with STE/ICE is located on 2-48.47.

C Procedures for performing STE/ICE tests referenced in the troubleshooting can be found in Section IV of this chapter.

TA312685

HOW TO USE THIS SECTION

Ⓐ Look in quick guide to troubleshooting and find the name of the item that doesn't work.

Ⓑ Find the problem with the item.

Ⓒ Find the solution to the problem.

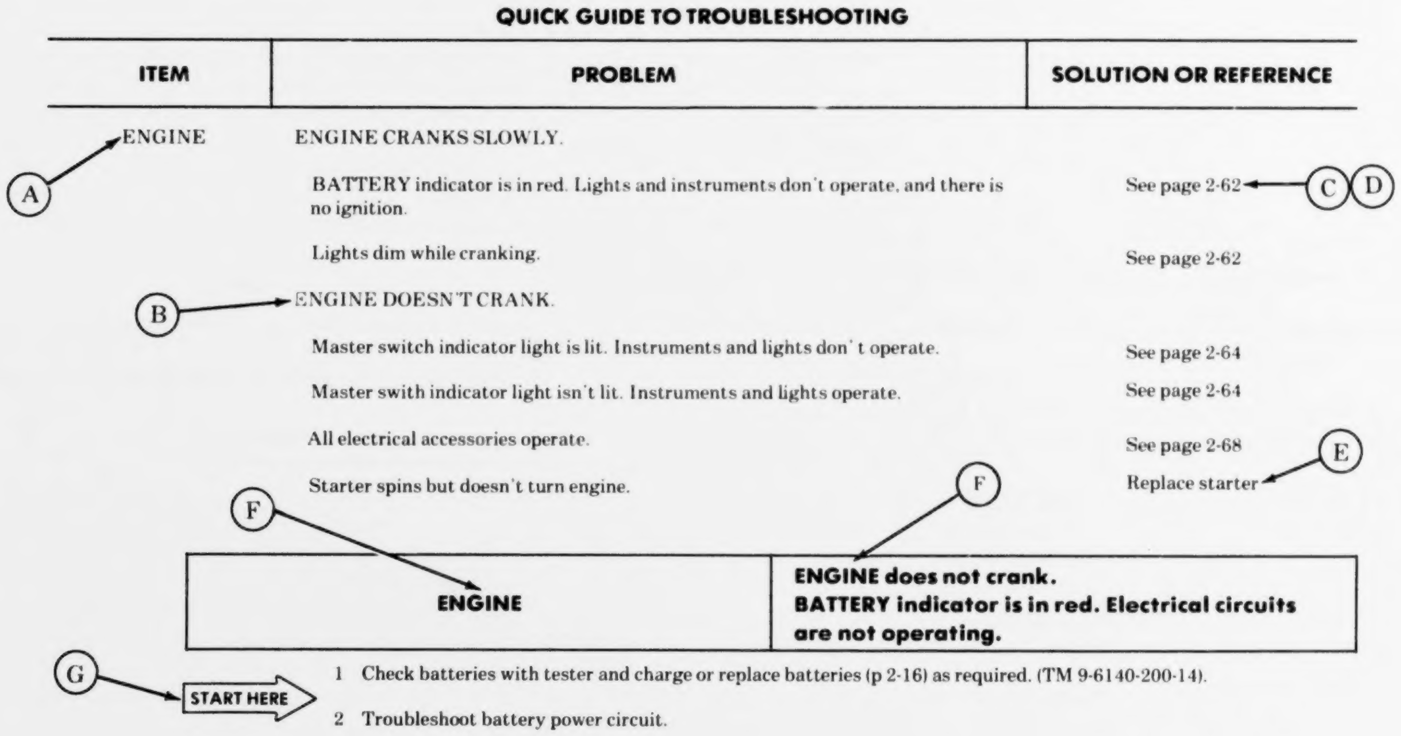
Ⓓ Turn to the page referenced.

or

Ⓔ Do the maintenance procedure given.

Ⓕ Locate page in troubleshooting section, find item and problem.

Ⓖ Follow steps to fix the item.



QUICK GUIDE TO TROUBLESHOOTING

ITEM	PROBLEM	SOLUTION OR REFERENCE
ENGINE	ENGINE CRANKS SLOWLY.	
	BATTERY indicator is in red. Lights and instruments don't operate, and there is no ignition.	See page 2-62
	Lights dim while cranking.	See page 2-62
	ENGINE DOESN'T CRANK.	
	Master switch indicator light is lit. Instruments and lights don't operate.	See page 2-64
	Master swith indicator light isn't lit. Instruments and lights operate.	See page 2-64
	All electrical accessories operate.	See page 2-68
	Starter spins but doesn't turn engine.	Replace starter

ENGINE	ENGINE does not crank. BATTERY indicator is in red. Electrical circuits are not operating.

START HERE

1 Check batteries with tester and charge or replace batteries (p 2-16) as required. (TM 9-6140-200-14).

2 Troubleshoot battery power circuit.

TA310409

M992 VEHICLE TEST CARD -VID II Additional Test Connections

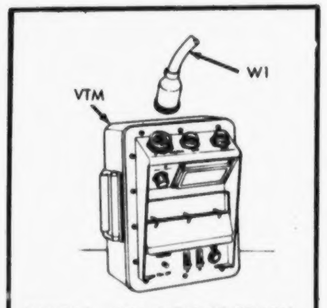


FIGURE 1. DCA CABLE W1 TO VTM

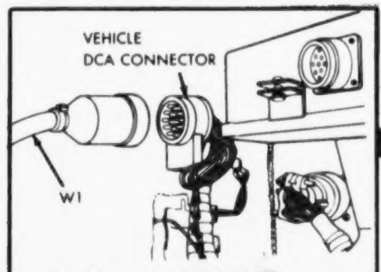
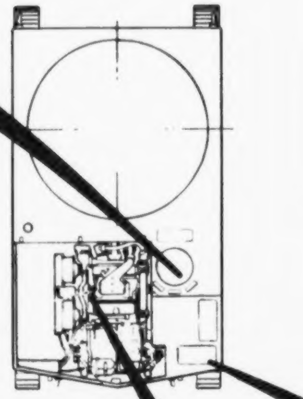

VEHICLE
DCA CONNECTOR
W1

FIGURE 2. DCA CABLE W1 TO VEHICLE DCA CONNECTOR



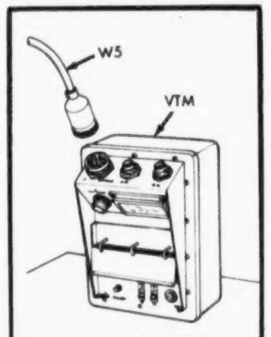


FIGURE 3. VTM TO CABLE W5

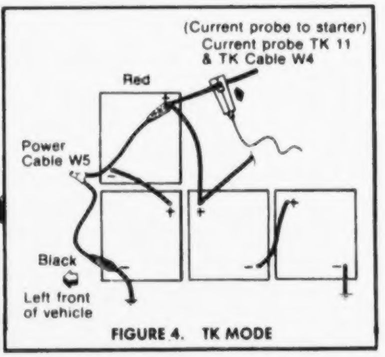

(Current probe to starter)
Current probe TK 11
& TK Cable W4
Red
Power
Cable W5
Black
Left front
of vehicle

FIGURE 4. TK MODE

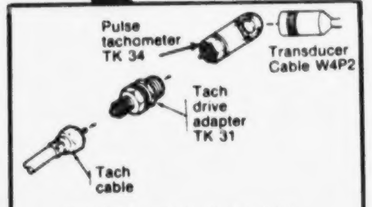
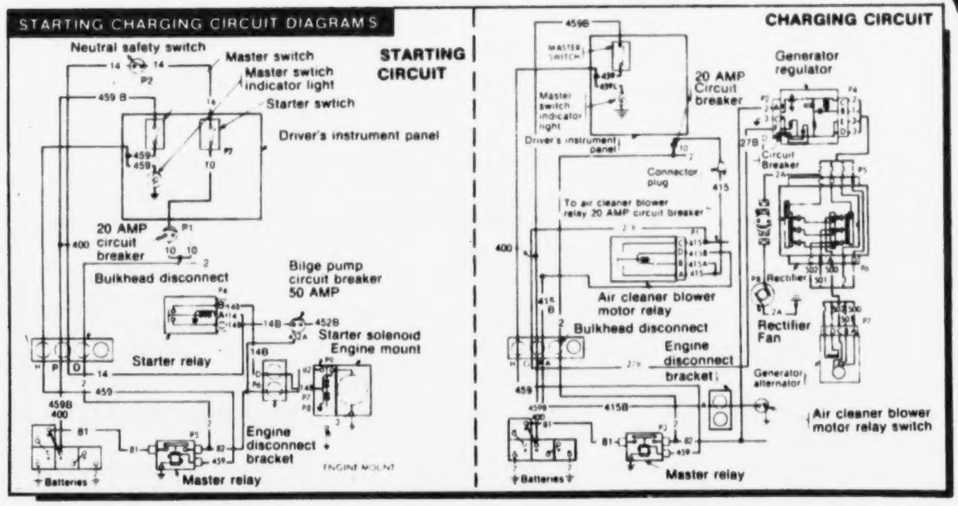

Pulse
tachometer
TK 34
Transducer
Cable W4P2
Tach
drive
adapter
TK 31
Tach
cable

FIGURE 5. TK TACH HOOK UP


STARTING CHARGING CIRCUIT DIAGRAMS
STARTING
CIRCUIT
Neutral safety switch
Master switch
Master swtich
indicator light
Starter swtich
Driver's instrument panel
20 AMP
circuit
breaker
Bulkhead disconnect
Bilge pump
circuit breaker
50 AMP
Starter solenoid
Engine mount
Starter relay
Engine
disconnect
bracket
ENGINE MOUNT
Batteries
Master relay
CHARGING CIRCUIT
MASTER SWITCH
Master
switch
indicator
light
Driver's instrument
panel
20 AMP
Circuit
breaker
Generator
regulator
Connector
plug
To air cleaner blower
relay 20 AMP circuit breaker
Circuit
Breaker
Air cleaner blower
motor relay
Bulkhead disconnect
Rectifier
Rectifier
Fan
Engine
disconnect
bracket
Generator
alternator
Air cleaner blower
motor relay switch
Batteries
Master relay

Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. If test limits are different, use vehicle TM's specifications.

M992 VEHICLE TEST CARD - VID 11

PRE-TEST INSPECTION	POWERING UP VTM	
	DCA MODE	TK MODE (USED WHEN DCA IS INOPERABLE OR NOT APPLICABLE TO TEST)
1. Oil Level 2. Coolant Level 3. Fuel Level 4. Battery Electrolyte Level	1. Connect DCA Cable W1 to VTM Fig 1. 2. Connect DCA CABLE W1 to Vehicle DCA Connector Fig 2. 3. Perform Confidence Test 66/99. 4. Enter vehicle VID Number using Test 60.	1. Connect VTM to Cable W5 Fig 3. 2. Connect Cable W5 to Batteries Fig 4. 3. Perform Confidence Test 66/99. 4. Enter vehicle VID Number 11 using Test 60. (See Note.)

Be sure to keep a log on all performance parameters. This will be your best indication of system deterioration to failure.
Note: When using TK mode, remove DCA Transducers as required to install STE-ICE Kit Transducers.

MEASUREMENT NAME	DCA VTM TEST NOS.	VTM OFFSET LIMITS	OPERATING CONDITION	TK VTM TEST NOS.	SPECIAL TK CONNECTION REQUIRED	LIMITS		UNITS
						MIN	MAX	
Battery Voltage	67	–	Engine Off	67	Fig 4	22	-	Volts
Current First Peak	72	+ 225	Crank on Go	72	Fig 4	875	1680	Amps
Vehicle Gage Oil Pressure	–	–	Idle - Use Test 10 to check IDM RPM.	–	Fig 5	10	-	PSI
Charging Voltage	01, 67	–	Lights & Acc on 1000-1200 RPM	01, 67	Fig 5	27.5	28.5	Volts
Vehicle Gage Cool. Temp	–	–	Warm Engine	–	–	170	185	°F
Vehicle Gage Oil Temp	–	–	At 1000 RPM - Use Test 10.	–	Fig 5	30	50	PSI
Engine RPM Average	10	–	Idle	10	Fig 5	550	600	RPM
Engine RPM Average	10	–	Governor	10	Fig 5	2350	2500	RPM
Power	13	–	Warm Engine	13	Fig 5	TBD*	-	%
Compression Unbalance	14	–	Warm Engine Crank on Go	14	–	-	10	%
Cranking RPM	10	–	Cranking	10	Fig 5	100	-	RPM
Cranking Voltage	67	–	Cranking	67	Fig 4	18	-	Volts
Cranking Current	03, 71	±225	Cranking	90	Fig 4	350	550	Amps
Battery Pack Internal Resistance	73	±225	Crank on Go	73	Fig 4	-	13	Milliohms
Starter Circuit Resistance	74	±225	Crank on Go	74	Fig 4	3	25	Milliohms
Battery Pack Resistance Change	75	±225	Crank on Go	75	Fig 4	-	50	Milliohms/sec

*To be determined (TBD)
Typical power % for an engine with a turbocharger and fuel limiting device is 68%. If power % falls below 60%, investigate further.

QUICK GUIDE TO TROUBLESHOOTING

Item	Problem	Solution or Reference
ENGINE	ENGINE CRANKS SLOWLY	
	BATTERY indicator is in red. Electrical circuits not operating.	See page 2-61
	Lights dim while cranking.	See page 2-61
	ENGINE DOESN'T CRANK	
	MASTER switch indicator light is ON. Instruments and lights don't operate.	See page 2-63
	MASTER switch indicator light isn't on. Instruments and lights don't operate.	See page 2-63
	MASTER switch indicator light isn't on. Instruments and lights operate.	See page 2-63
	All electrical accessories operate.	See page 2-66
	Starter spins but doesn't turn engine.	Replace starter
	ENGINE CRANKS BUT DOESN'T START	See page 2-75
	ENGINE IDLES OVER 650 RPM	See page 2-75
	ENGINE DOESN'T ACCELERATE PROPERLY	See page 2-76
	ENGINE DOESN'T KEEP STEADY SPEED	See page 2-80
	ENGINE DOESN'T DEVELOP FULL POWER	See page 2-80
	Engine runs slowly and idles roughly.	

TA312686

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
ENGINE (cont.)	ENGINE USES TOO MUCH OIL	See page 2-81
	ENGINE USES TOO MUCH FUEL	See page 2-81
	BLUE EXHAUST SMOKE IS PRESENT	Notify Support Maintenance
	BLACK EXHAUST SMOKE IS PRESENT AFTER ENGINE WARM-UP	See page 2-82
	WHITE EXHAUST SMOKE IS PRESENT	See page 2-82
	EXHAUST FUMES ARE PRESENT IN CREW COMPARTMENT	See page 2-83
	Eyes burn and exhaust smell is present.	
	ENGINE HAS LOW OR NO OIL PRESSURE	See page 2-83
	ENGINE OVERHEATS	See page 2-84
TRANSMISSION AND DRIVING CONTROLS	HAND THROTTLE CONTROL DOESN'T MAINTAIN CONSTANT SPEED	Check for loose mounting bolts on hand throttle control rod and accelerator shaft.
	ENGINE DOESN'T INCREASE RPM WHEN ENGINE IS ACCELERATED	Adjust accelerator pedal and hand throttle control rod (p 7-47).
	VEHICLE CREEPS FORWARD IN NEUTRAL	Adjust transmission shift control linkage (p 7-34).
	TRANSMISSION OVERHEATS	
	TRANSMISSION OIL TEMP gage is over 270°F. MASTER WARNING light is lit.	See page 2-85

TA310411

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
TRANSMISSION AND DRIVING CONTROLS (cont.)	VEHICLE DOESN'T DRIVE	
	Transmission doesn't operate in any shift position	See page 2-85
	Shift lever is in third gear, but transmission is in first gear.	Adjust transmission shift control linkage (p 7-34).
	VEHICLE DOESN'T STEER IN EITHER DIRECTION IN ANY RANGE	See page 2-90
	VEHICLE STEERS IN ONE DIRECTION ONLY	See page 2-92
TRACKS AND SUSPENSION	VEHICLE BRAKES POORLY	
	Vehicle doesn't stop when braked.	See page 2-92
	VEHICLE PULLS TO ONE SIDE WITH STEERING WHEEL IN CENTER POSITION	See page 2-93
	VEHICLE THROWS TRACKS	See page 2-94
	VEHICLE SAGS TO ONE SIDE	Check for correct installation of torsion bars (p 8-16).
	SUSPENSION SYSTEM IS NOISY DURING OPERATION	See page 2-94
BATTERY POWER	BATTERY SUPPLIES NO ELECTRICAL POWER	
	BATTERY indicator is in red. Lights and instruments don't operate, and there is no ignition.	See page 2-61
	ENGINE CRANKS SLOWLY	See page 2-61

TA310412

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
STARTER MOTOR	STARTER MOTOR DOESN'T OPERATE	See page 2-67
FLAME HEATER	FLAME HEATER DOESN'T OPERATE	
	Motor and pump assembly doesn't operate.	See page 2-95
	Fuel solenoid doesn't operate.	See page 2-95
	Fuel prime pump doesn't operate.	See page 2-95
	Ignition unit doesn't operate.	See page 2-95
ENGINE MASTER WARNING LIGHT (STEERING SHAFT)	STEERING SHAFT MASTER WARNING LIGHT DOESN'T LIGHT	See page 2-106
	STEERING SHAFT MASTER WARNING LIGHT DOESN'T LIGHT WHEN PRESS-TO-TEST IS PERFORMED	See page 2-106
ENGINE MASTER WARNING LIGHT (PORTABLE INSTRUMENT PANEL)	MASTER WARNING LIGHT DOESN'T LIGHT	
	MASTER switch is ON and engine is off, but MASTER WARNING light isn't on.	See page 2-109
	MASTER WARNING LIGHT IS ON	
	Everything appears normal, but MASTER WARNING light is ON.	See page 2-109
AIR CLEANER DUST EXHAUSTER MOTOR	MOTOR DOESN'T OPERATE	
	Engine is running, but dust exhauster motor doesn't operate.	See page 2-113

TA310413

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
AIR CLEANER DUST EXHAUSTER MOTOR (cont.)	MOTOR DOESN'T STOP	See page 2-113
	Engine is off and MASTER switch is ON, and motor runs.	See page 2-113
	ONE BLOWER MOTOR DOESN'T OPERATE	See page 2-113
GENERATOR (ALTERNATOR)	CHARGING SYSTEM DOESN'T OPERATE	See page 2-119
	Gage shows no charge with engine running or isn't steady or accurate.	See page 2-119
	BATTERY IS OVERCHARGING	See page 2-119
	BATTERY gage is in right red.	See page 2-119
GAGES	ENGINE COOLANT TEMPERATURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE	See page 2-129
	ENGINE LOW LEVEL COOLANT LIGHT DOESN'T LIGHT OR GIVES FALSE INDICATION OF COOLANT LOW LEVEL CONDITIONS	See page 2-129
	ENGINE OIL PRESSURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE	See page 2-135
	TRANSMISSION OIL TEMPERATURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE	See page 2-137
	TRANSMISSION OIL PRESSURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE	See page 2-141
	BATTERY GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE	See page 2-119

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QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
GAGES (cont.)	FUEL LEVEL GAGE NEEDLE DOESN'T MOVE	See page 2-143
	FUEL LEVEL GAGE SHOWS LEVEL FOR LOWER TANK BUT NOT FOR UPPER TANK	See page 2-143
	FUEL LEVEL GAGE SHOWS LEVEL FOR UPPER TANK BUT NOT FOR LOWER TANK	See page 2-143
SERVICE HEADLIGHTS, TAILLIGHTS, AND STOPLIGHTS	ALL LIGHTS ARE OUT	See page 2-149
	HEADLIGHTS ARE OUT	See page 2-149
	ONE BEAM ONLY ON HEADLIGHT OPERATES	See page 2-149
	RIGHT OR LEFT HEADLIGHT IS OUT	See page 2-149
	TAILLIGHT IS OUT	See page 2-149
	STOPLIGHT IS OUT	See page 2-149
BLACKOUT MARKERS AND BLACKOUT DRIVE LIGHTS	BLACKOUT MARKER LIGHTS ARE OUT	See page 2-157
	FRONT BLACKOUT MARKERS ARE OUT	See page 2-157
	RIGHT OR LEFT FRONT BLACKOUT MARKER IS OUT	See page 2-157
	REAR BLACKOUT MARKERS ARE OUT	See page 2-157
	RIGHT OR LEFT REAR BLACKOUT MARKER IS OUT	See page 2-157
	BLACKOUT DRIVE LIGHT IS OUT	See page 2-157

TA310415

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
SERVICE BLACKOUT INFRARED HEADLIGHTS	BOTH BEAMS DON'T OPERATE	See page 2-163
	ONE BEAM DOESN'T OPERATE	See page 2-163
	BLACKOUT STOPLIGHT IS OUT	See page 2-163
INSTRUMENT PANEL LIGHTS	ONE OR MORE LIGHTS ARE OUT	See page 2-170
	ALL LIGHTS ARE OUT	See page 2-170
	LIGHTS ARE OUT ON BRIGHT OR DIM	Replace dimmer switch (p 6-38).
PERSONNEL HEATER	PERSONNEL HEATER DOESN'T OPERATE	See page 2-172
PERSONNEL VENTILATION BLOWER	VENTILATION BLOWER DOES NOT OPERATE	See page 2-177
	VENTILATION BLOWER OPERATES, BUT DOES NOT COME ON AUTOMATICALLY IN EXHAUST MODE DURING AFES TEST	See page 2-177
	VENTILATION BLOWER RESET SWITCH DOES NOT RESET SYSTEM AFTER AFES CREW COMPARTMENT TEST	See page 2-177
	AIR CIRCULATION ISN'T SUFFICIENT	See page 2-189
BILGE PUMP	BILGE PUMP DOESN'T OPERATE	See page 2-190
WINTERIZATION KIT	COOLANT HEATER DOESN'T OPERATE	See page 2-201
	HEATER BLOWER OPERATES, BUT MOTOR DOESN'T OPERATE	See page 2-201
	HEATER MOTOR OVERHEATS	See page 2-201

TA310416

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
PARKING BRAKE	PARKING BRAKE WARNING LIGHT IS OUT	See page 2-196
ELECTRICAL FUEL PUMP	ENGINE MISSES WHEN LOW ON FUEL	See page 2-199
CONVEYOR	CONVEYOR CHAIN WILL NOT MOVE	See page 2-206
	CONVEYOR CHAIN JAMMED OR BROKEN	See page 2-206
	CONVEYOR CHAIN CREEPS	See page 2-206
	CONVEYOR MOVES IN ONE DIRECTION ONLY	See page 2-206
STACKER	PROJECTILE TRAY DOES NOT MOVE UP OR DOWN	See page 2-228
	PROJECTILE TRAY FAILS TO HOLD	See page 2-228
	PROJECTILE TRAY RAISES AND LOWERS ROUGHLY	See page 2-228
	PROJECTILE TRAY MOVES IN ONE DIRECTION ONLY	See page 2-228
	STACKER CHAIN BROKEN	Replace roller chain (p 12-32).
	WINCH DOES NOT OPERATE	See page 2-240
	PROJECTILE TRAY WILL NOT SLIDE, OR SLIDES WITH DIFFICULTY	See page 2-241
	PROJECTILE TRAY DOES NOT LOCK IN POSITION	See page 2-241
	PROJECTILE TRAY HAS EXCESSIVE PLAY ON SUPPORT SHAFT	Adjust projectile tray rollers (p 12-38).

TA310417

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
STACKER (cont.)	STACKER MOVES WITH DIFFICULTY ACROSS CARGO COMPARTMENT	See page 2-239
UPPER REAR DOOR (BALLISTIC SHIELD)	DOOR DOES NOT GO UP OR DOWN	See page 2-218
	DOOR WILL NOT REMAIN IN OPEN POSITION	See page 2-218
	DOOR RAISES OR LOWERS ROUGHLY	See page 2-218
PRIMARY HYDRAULIC PUMP	INSUFFICIENT OR NO SYSTEM OIL PRESSURE	See page 2-242
	LOSS OF HYDRAULIC PRESSURE DURING OPERATION	See page 2-242
BACKUP HYDRAULIC PUMP	PUMP DOES NOT OPERATE	See page 2-244
	PUMP OPERATES INTERMITTENTLY	See page 2-244
NBC VENTILATED FACE PIECE SYSTEM	INSUFFICIENT OR NO AIR FLOW AT QUICK-DISCONNECT FITTINGS	See page 2-246
	AIR PURIFIER MOTOR DOES NOT OPERATE	See page 2-246
	M3 HEATER DOES NOT OPERATE	See page 2-246
AUXILIARY POWER UNIT	ENGINE CRANKS BUT FAILS TO START	See page 2-252
	ENGINE OVERHEATING	See page 2-258
	ENGINE STARTS BUT FAILS TO KEEP RUNNING	See page 2-260
	ENGINE HARD TO START	See page 2-261
	ENGINE HARD TO START IN COLD WEATHER	See page 2-261

QUICK GUIDE TO TROUBLESHOOTING (CONTINUED)

Item	Problem	Solution or Reference
AUXILIARY POWER UNIT (cont.)	ENGINE MISFIRES	See page 2-262
	ENGINE LACKS POWER	See page 2-263
	ENGINE FAILS TO CRANK WHEN STARTING SWITCH IS OPERATED	See page 2-270
APU STARTER/GENERATOR	GENERATOR CHARGING SYSTEM INDICATOR READS IN YELLOW OR RED REGIONS WITH APU OPERATING AND APU GENERATOR SWITCH ON	See page 2-264
ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM ENGINE FIRE DETECTION T/A PANEL INDICATORS (EFFECTIVE FOR VEHICLES 1 THRU 344)	POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON	See page 2-281
	FAULT LAMP REMAINS ON	See page 2-281
CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM CREW FIRE DETECTION T/A PANEL INDICATORS (EFFECTIVE FOR VEHICLES 1 THRU 344)	POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON	See page 2-296
	FAULT LAMP REMAINS ON	See page 2-296
ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM ENGINE FIRE DETECTION T/A PANEL INDICATORS (EFFECTIVE FOR VEHICLES 345 AND ABOVE)	POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON	See page 2-306.2.1
	FAULT LAMP REMAINS ON	See page 2-306.7
CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM CREW FIRE DETECTION T/A PANEL INDICATORS (EFFECTIVE FOR VEHICLES 345 AND ABOVE)	POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON	See page 2-306.18
	FAULT LAMP REMAINS ON	See page 2-306.25
ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM ENGINE FIRE DETECTION T/A PANEL INDICATORS	POWER ON LAMPS DO NOT STAY LIT WHEN MASTER SWITCH IS TURNED OFF	See page 2-306.33
CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM CREW FIRE DETECTION T/A PANEL INDICATORS	POWER ON LAMPS DO NOT STAY LIT WHEN MASTER SWITCH IS TURNED OFF	See page 2-306.34

TROUBLESHOOTING CHARTS

ENGINE	**ENGINE CRANKS SLOWLY** **BATTERY indicator is in red. Electrical circuits are not operating. Lights dim while cranking.**

START HERE

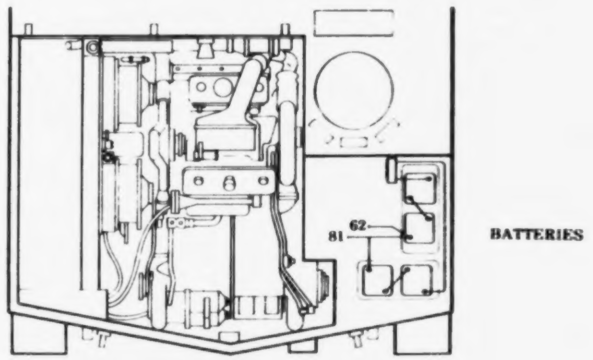
1 Run STE/ICE Test No. 67 (cranking) (p 2-48.28). If test fails, go to step 3.

2 Run STE/ICE Test No. 80 (p 2-48.37).

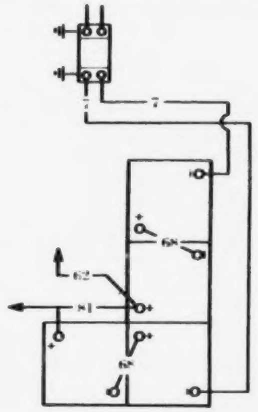
a If test passes, go to step 3.
b If test fails, replace batteries (p 6-42) and verify no faults.

3 Troubleshoot battery power circuit.

BATTERY POWER CIRCUIT



PICTORIAL VIEW

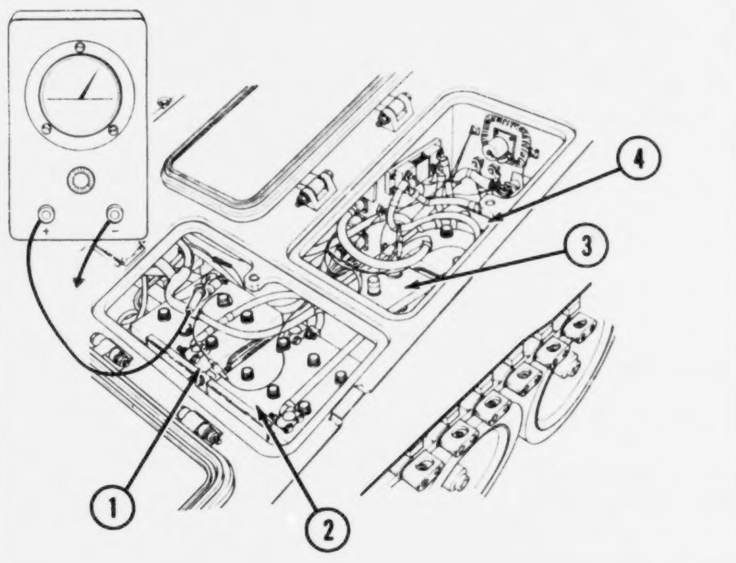


ELECTRICAL DIAGRAM

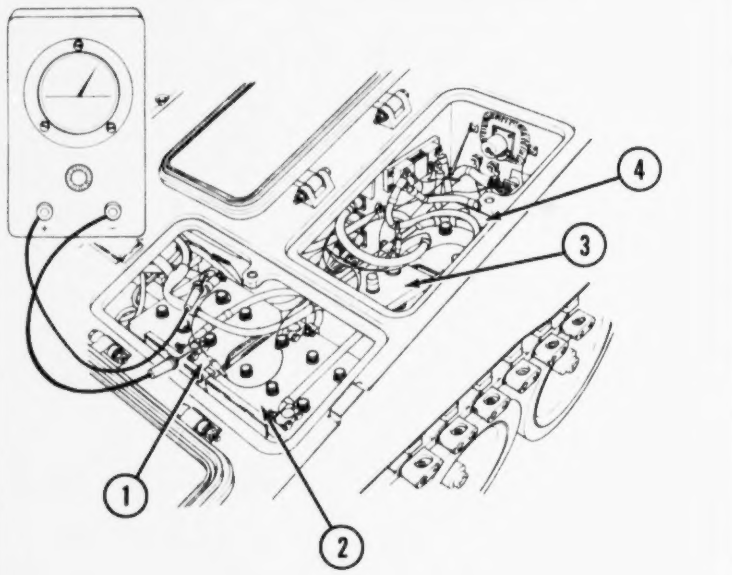
TA312687

NOTE

When using multimeter refer to DA Pam 750-33 for setup of multimeter.



A Place red multimeter lead on positive post of battery 1, and black lead to ground. Crank engine and check voltage. If voltage is below 18 volts while cranking, clean, tighten, repair or replace necessary cables and charge batteries. Crank engine and check voltage. If voltage is still below 18 volts, go to step B.



B Place red multimeter lead on positive post and black lead on negative post of battery 1. Crank engine and check voltages; voltage reading should not be below 9 volts. Repeat on batteries 2, 3 and 4. Check all batteries. Service batteries metering below 9 volts (p 6-42).

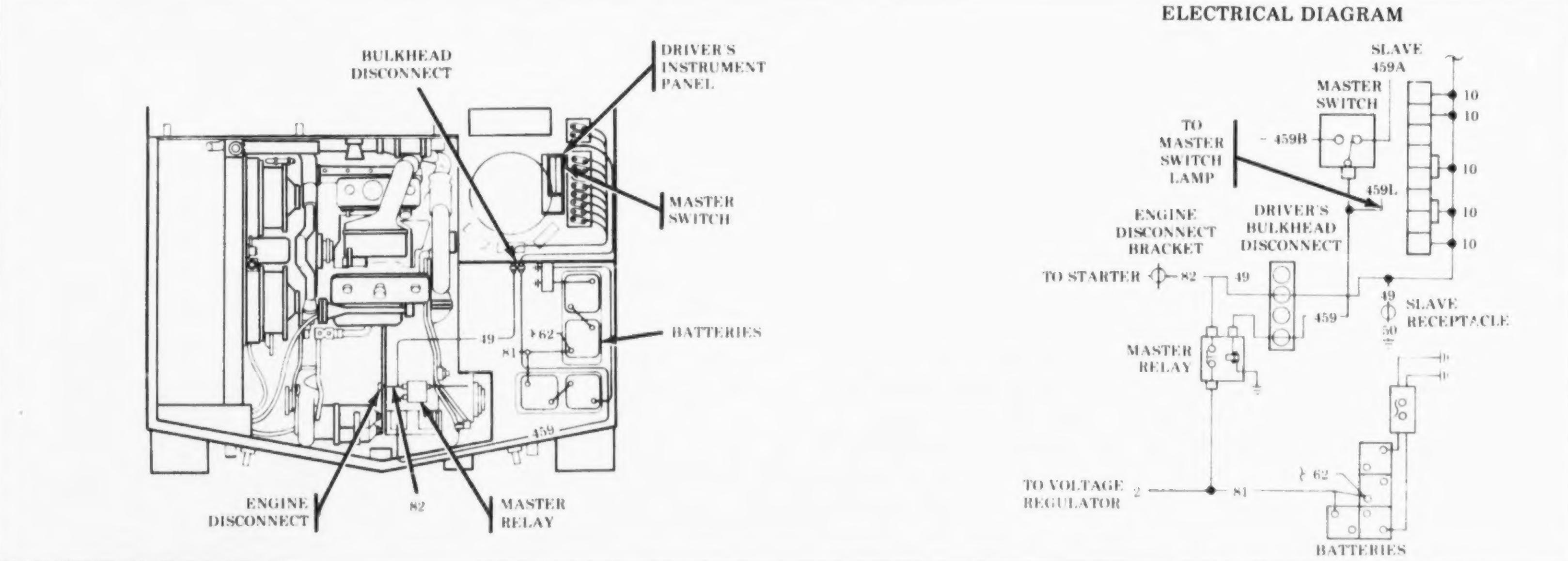
TA310421

ENGINE	**ENGINE DOESN'T CRANK** **Master switch indicator light is on. Instruments and lights don't operate. Do steps A through D.** **Master switch indicator light isn't on. Instruments and lights don't operate. Do step C.** **Master switch indicator light isn't on. Instruments and lights operate. Do step E.**

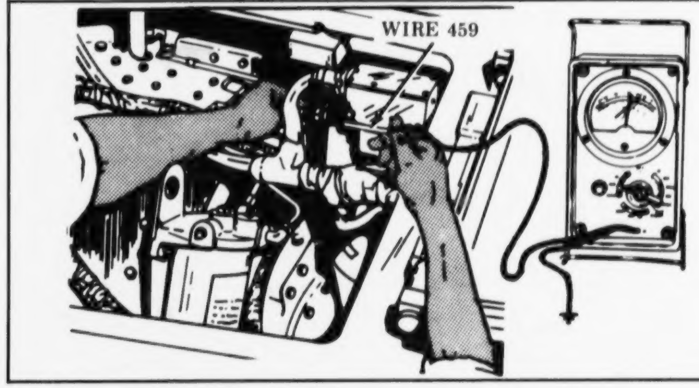
START HERE

Troubleshoot master relay circuit.

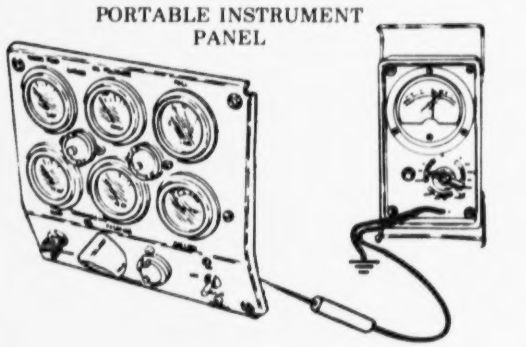
MASTER RELAY CIRCUIT


BULKHEAD DISCONNECT
DRIVER'S INSTRUMENT PANEL
MASTER SWITCH
BATTERIES
49
62
81
459
ENGINE DISCONNECT
82
MASTER RELAY
ELECTRICAL DIAGRAM
SLAVE 459A
MASTER SWITCH
TO MASTER SWITCH LAMP
459B
459L
10
10
10
10
10
ENGINE DISCONNECT BRACKET
DRIVER'S BULKHEAD DISCONNECT
TO STARTER
82
49
459
49
SLAVE RECEPTACLE
50
MASTER RELAY
TO VOLTAGE REGULATOR
2
81
62
BATTERIES

TA310422



A Turn MASTER switch ON. Disconnect wire 459 from master relay. Place red lead of multimeter in wire 459 and ground black lead. Check for voltage. If no voltage, go to step B. If voltage is present, go to step D.

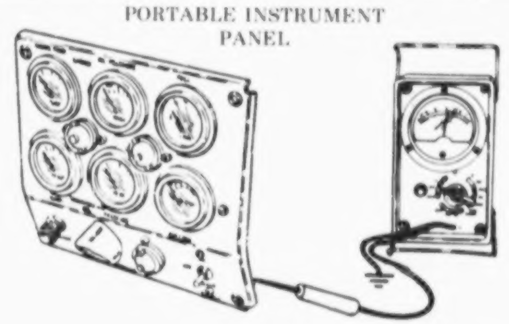


NOTE

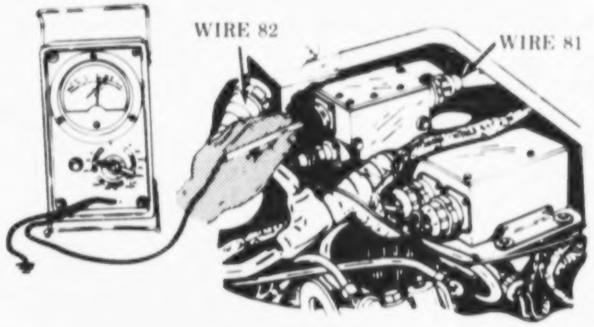
To trace circuit 459, check wiring harnesses 10921380 (p 6-72), 12260287 (p 6-84) and 12260298 (p 6-89). If cargo compartment wiring harness 12330252 is defective, notify Support Maintenance.

B Disconnect wire 459 from MASTER switch (center plug on back of switch). Place red multimeter lead in switch and black lead to ground. With MASTER switch ON, check for voltage. If voltage is present, repair or replace circuit 459 from MASTER switch to master relay. If no voltage, go to step C.

TA310423



C With MASTER switch ON, disconnect wire 459B from MASTER switch (bottom plug). Place red multimeter lead in wire 459B, ground black lead and check for voltage. If voltage is present, replace MASTER switch (p 6-19). If no voltage, repair or replace wire 459B-400.

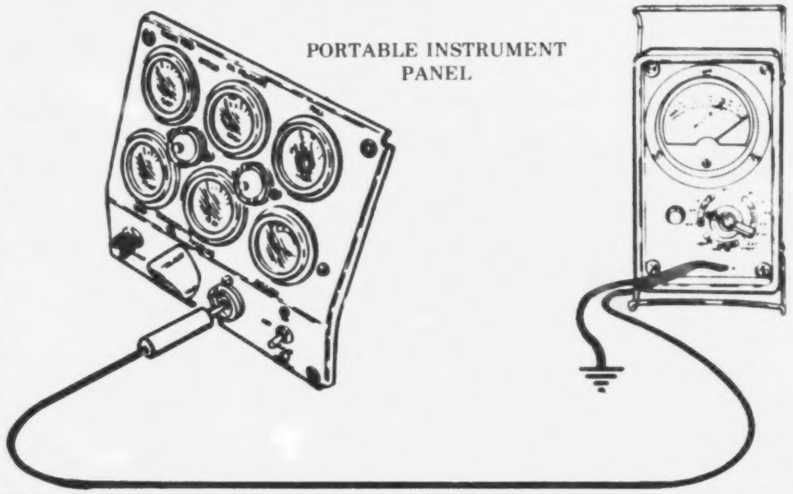


NOTE

To trace circuit 459B-400, check wiring harnesses 12268100 (p 6-68), 12260287 (p 6-84) and 12260298 (p 6-89).

D Reconnect all wires and check wire 81 for breaks, cuts and corroded terminals. Replace if necessary (p 6-68). Disconnect wire 82 from master relay. Place red multimeter lead in master relay and ground black lead. Check voltage. If no voltage is present, replace master relay (p 6-45). If voltage is present, repair or replace wire 82 (Appx F).

TA310424



E Remove master switch indicator light from socket. Place red multimeter lead in center of socket and black lead to ground. Check for voltage. If voltage is present, replace light bulb. If no voltage, repair or replace wire 459L (p 6-89).

ENGINE	**ENGINE DOESN'T CRANK** **All electrical accessories operate.**

START HERE

1 Run STE/ICE Test No. 71 (p 2-48.31).

a If reading is greater than 550 amps, attempt to rotate engine manually.
  (1) Remove access plate (p 9-25).
  (2) Pull and hold FUEL SHUTOFF handle.
  (3) Using 3/4 in. drive socket and breaker bar placed on bolt of vibration dampener, rotate engine manually.
  (4) If engine does not rotate, notify Support Maintenance. If engine rotates, replace starter (p 6-18) and verify no faults.

b If reading is less than 350 amps, go to step 2.

c If reading is 0,, go to step 3.

TA312688

2 Run STE/ICE Test No. 74 (p 2-48.35).

   a If test fails, replace starter (p 6-13) and verify no faults.
   b If test passes, go to step 3.

3 Troubleshoot starter motor circuit.

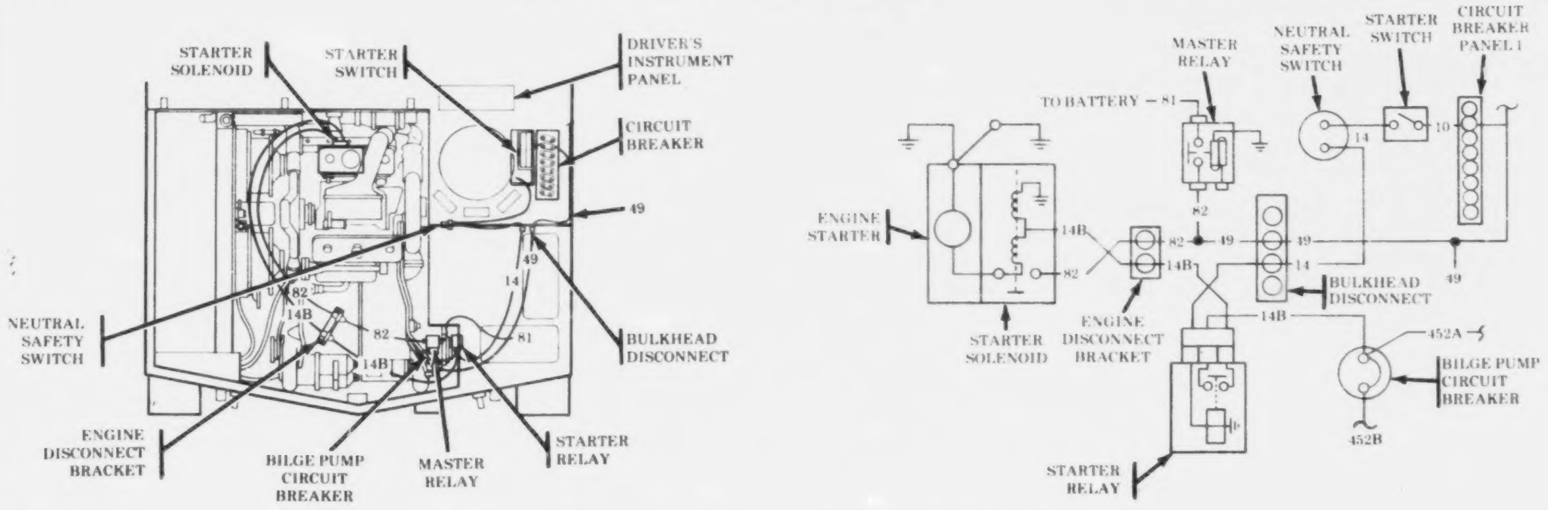
NOTE

Ensure the shift lever is in the neutral position before troubleshooting this circuit.

STARTER MOTOR CIRCUIT

NOTE

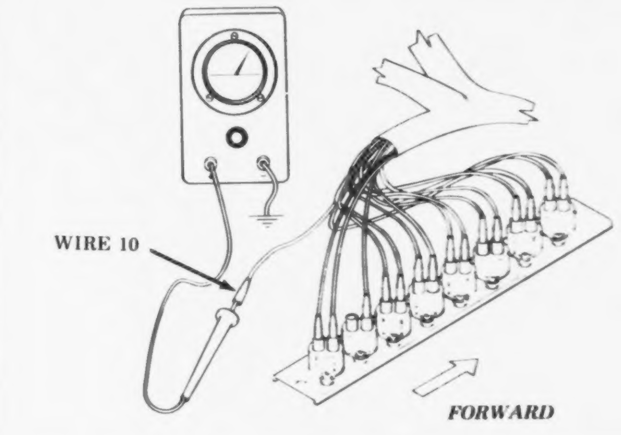
DRIVER'S INSTRUMENT PANEL SHOWN OUT OF POSITION FOR CLARITY.


STARTER SOLENOID
STARTER SWITCH
DRIVER'S INSTRUMENT PANEL
CIRCUIT BREAKER
49
14
82
14B
81
NEUTRAL SAFETY SWITCH
ENGINE DISCONNECT BRACKET
BILGE PUMP CIRCUIT BREAKER
MASTER RELAY
STARTER RELAY
BULKHEAD DISCONNECT
MASTER RELAY
NEUTRAL SAFETY SWITCH
STARTER SWITCH
CIRCUIT BREAKER PANEL 1
TO BATTERY — 81
10
14
82
49
14B
ENGINE STARTER
STARTER SOLENOID
ENGINE DISCONNECT BRACKET
BULKHEAD DISCONNECT
452A
452B
BILGE PUMP CIRCUIT BREAKER
STARTER RELAY

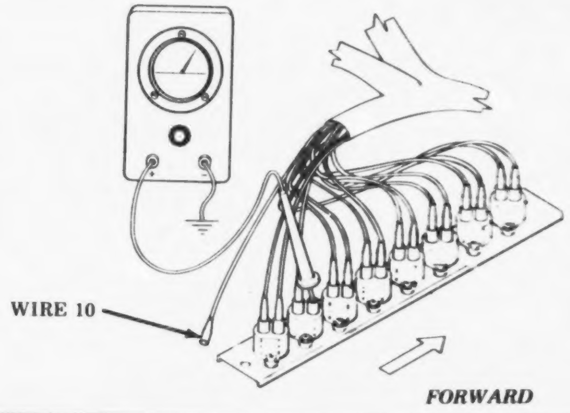
TA312689

NOTE

Turn Master switch ON, steps A through N.

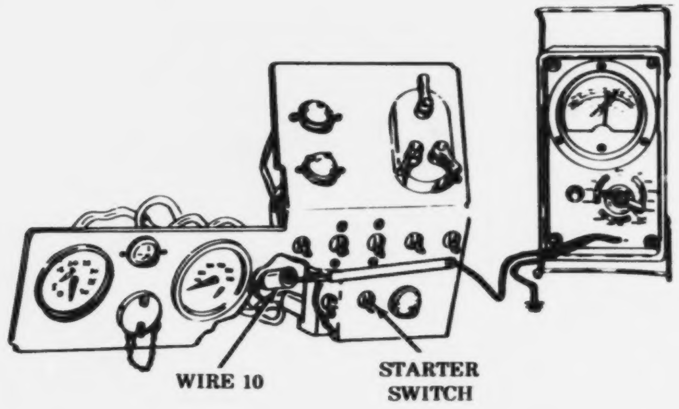


A Disconnect wire 10 from circuit breaker input. Place red lead of multimeter in connector and black lead to ground. Check for voltage. If voltage is present, go to step B. If no voltage, repair or replace wire 10 of input circuit (p 6-77).

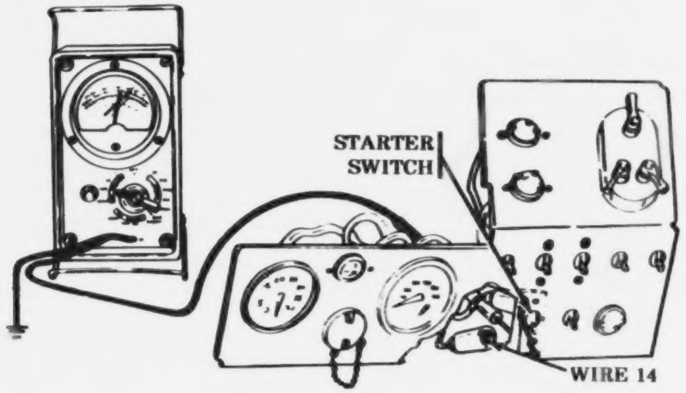


B Disconnect wire 10 from circuit breaker output. Using multimeter, place red lead in circuit breaker output and black lead to ground. Check for voltage. If voltage is present, go to step C. If no voltage, replace circuit breaker (p 6-54).

TA310427

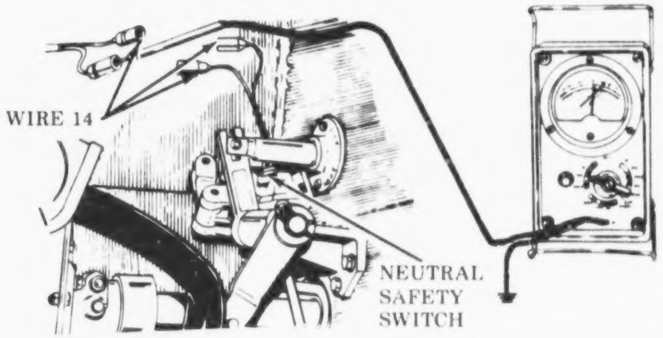


C Disconnect wire 10 from STARTER switch. Using multimeter, place red lead in wire 10. Ground black lead. Check for voltage. If voltage is present, go to step D. If no voltage, replace wire 10 from STARTER switch to circuit breaker (Appx F).

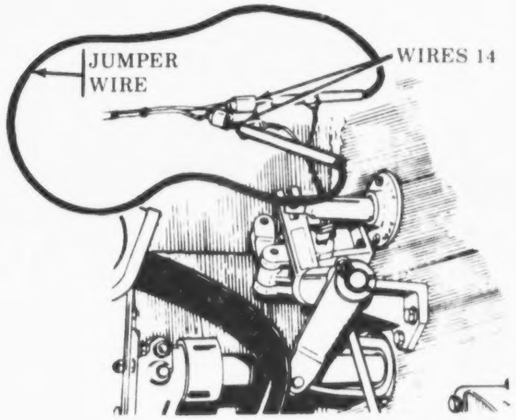


D Disconnect wire 14 at STARTER switch. Using multimeter, place red lead in STARTER switch output and black lead to ground. Push STARTER switch to check for voltage. If voltage is present, go to step E. If voltage is not present, replace STARTER switch (p 6-19).

TA310428

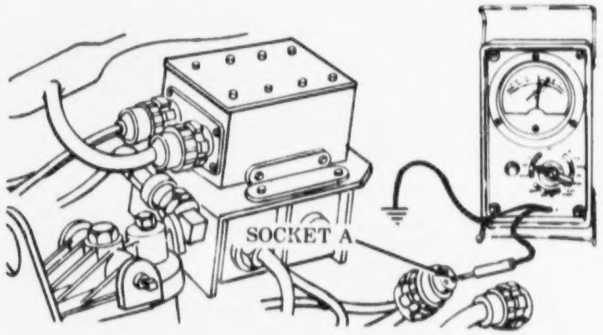


E Disconnect both wires numbered 14 at neutral safety switch. Place red multimeter lead in cable end of connector and black multimeter lead to ground. Push STARTER switch and check for voltage in each wire. If voltage is present in either wire, go to step F. If no voltage, repair or replace wire 14 from neutral safety switch to STARTER switch (p 6-84).



F Using jumper wire, connect wires 14 together. Push STARTER switch. If engine cranks, adjust or replace neutral safety switch (p 6-16). Reconnect all wires. If engine doesn't crank, go to step G.

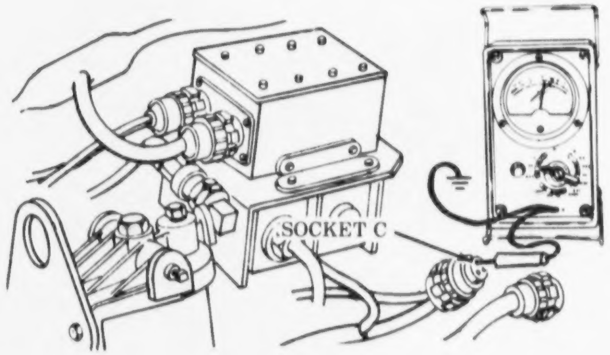
TA310429



NOTE

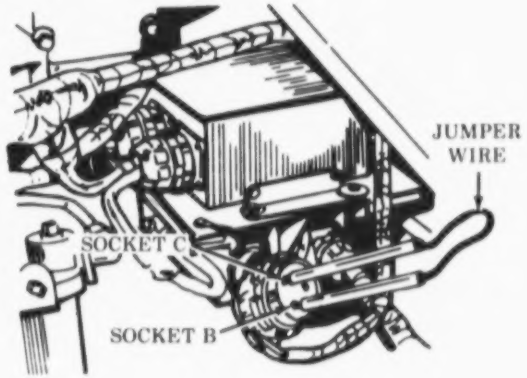
To trace circuit 14, check wiring harnesses 12268100 (p 6-68) and 12260287 (p 6-84).

G Disconnect electrical connector at starter relay. Using multimeter, place red lead in socket A and ground black lead. Place shift lever in neutral. Push STARTER switch and observe voltage. If no voltage is present, repair or replace wire 14 from starter relay to neutral safety switch. If voltage is present, go to step H.

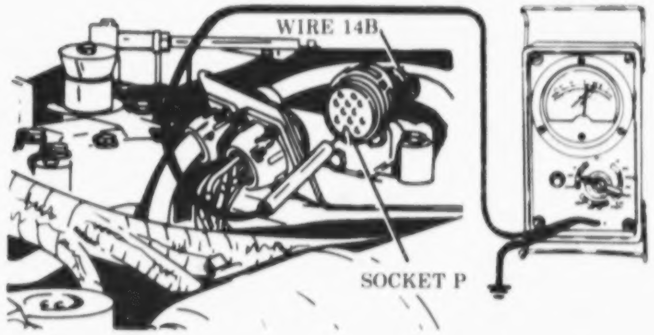


H Place red multimeter lead in socket C and ground black lead. Check for voltage. If no voltage, repair or replace wire 14B from starter relay to bilge pump circuit breaker (p 6-68). If voltage is present, go to step I.

TA310430

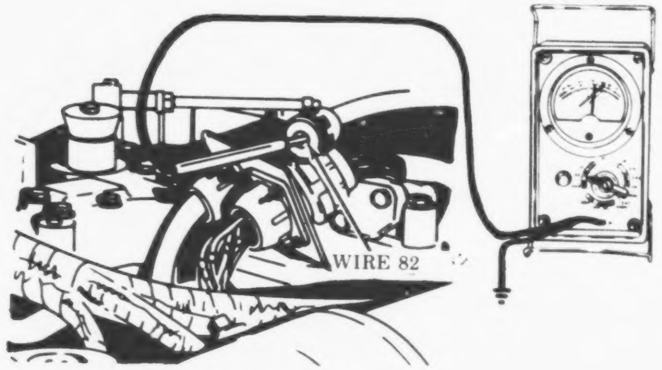


I With starter relay connector still disconnected, use jumper wire between socket C and socket B. If engine cranks, replace starter relay (p 6-46). If engine fails to crank, reconnect relay connector and go to step J.

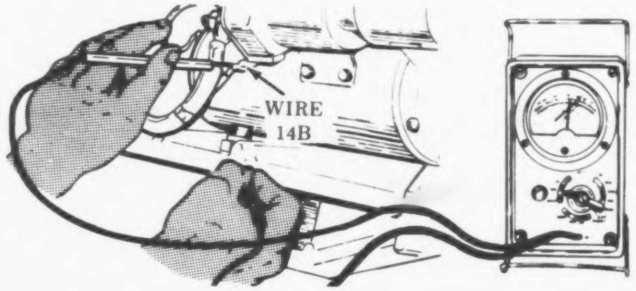


J To check circuit 14B, open connector at engine disconnect bracket. Using multimeter, place red lead in socket P and black lead to ground. Push STARTER switch and check for voltage. If no voltage, repair or replace wire 14B from engine disconnect bracket to starter relay (p 6-68). If voltage is present, reconnect wire 14B and go to step K.

TA310431

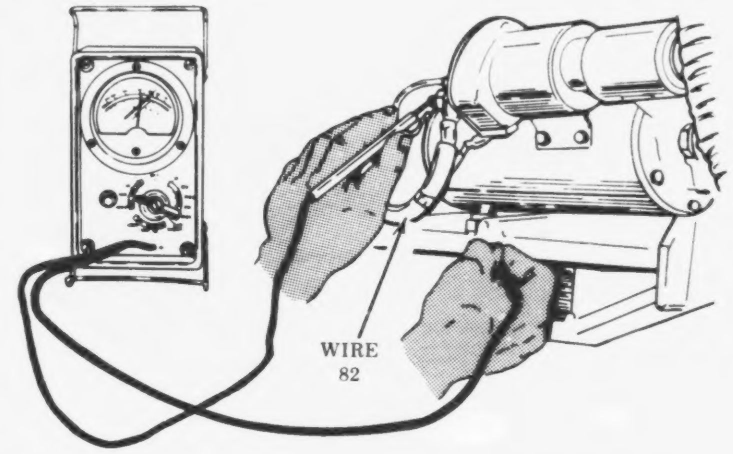


K To check wire 82, open connector at engine disconnect bracket. Place red multimeter lead in connector socket for wire 82 and black lead to ground. Check for voltage. If no voltage, repair or replace wire 82 from engine disconnect bracket to master relay (Appx F). If voltage is present, go to step L.

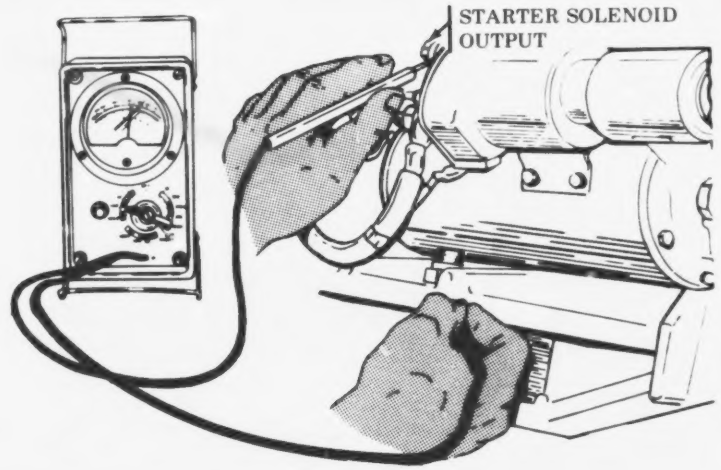


L Remove power plant from vehicle (p 3-1). Connect special equipment for operation of power plant out of vehicle (p 3-25). Place red multimeter lead on wire 14B at starter solenoid. Ground black wire. Place shift lever in neutral, push STARTER switch, and check for voltage at wire 14B. If no voltage, repair or replace wire 14B from engine disconnect bracket to starter solenoid (p 6-64). If voltage is present, go to step M.

TA310432



M Place red multimeter lead on wire 82 at starter solenoid and black lead to ground. Check for voltage at starter solenoid. If no voltage, repair or replace wire 82 from starter solenoid to engine disconnect bracket (p 6-64). If voltage is present, go to step N.



N Place red multimeter lead on starter solenoid output and black lead to ground. Place shift lever in neutral and close STARTER switch. Check for voltage. If no voltage, repair or replace starter solenoid (p 6-14). If voltage is present, replace engine starter (p 6-13).

TA310433

ENGINE	ENGINE CRANKS BUT DOESN'T START

START HERE

1 Check fuel shutoff lever.

2 Check fuel level. Fill tanks to visible level (TM 9-2350-267-10).

3 Check main fuel hose for proper connection at primary fuel filter (p 4-11).

4 Clean primary fuel filter and replace element (p 4-11).

5 Clean secondary fuel filter and replace element (p 4-13).

6 Check for pinched, kinked, or plugged fuel tubes or hoses. Replace if damaged (p 4-2 and 4-21).

7 Run STE/ICE Test No. 24 (p 2-48.15).

a If test passes, go to step 8.
b If test fails, replace fuel pump (p 4-16) and verify no faults.

8 Test engine fuel pump. Conduct fuel flow test (p 4-22).

ENGINE	ENGINE IDLES OVER 650 RPM

START HERE

1 Adjust hand throttle control rod and accelerator pedal (p 7-47).

2 Run STE/ICE Test No. 10 (idle) (p 2-48.7). If test fails notify Support Maintenance.

TA312690

ENGINE	ENGINE DOESN'T ACCELERATE PROPERLY

START HERE

1 Run STE/ICE Test No. 13 (p 2-48.10).

- a If test passes, go to step 2.
- b If test fails, notify Support Maintenance.

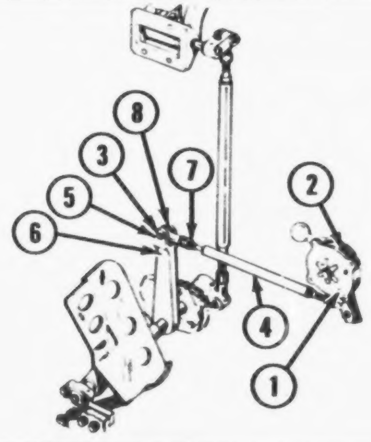
2 Run STE/ICE Test No. 24 (p 2-48.15).

- a If test passes, go to step 3.
- b If test fails, replace fuel pump and verify no faults.

3 Check brake adjustment (p 2-77 and 7-40).

4 Conduct fuel flow test (p 4-22).

HAND THROTTLE CONTROL ROD AND ACCELERATOR PEDAL: ADJUSTMENT



HAND THROTTLE CONTROL ROD: ADJUSTMENT

A Insert dowel pin (0.225-inch diameter) in positioning hole (1) of throttle lever cover (2). Remove cotter pin (hidden) and clevis pin (3) and remove control rod (4) from throttle lever (5).

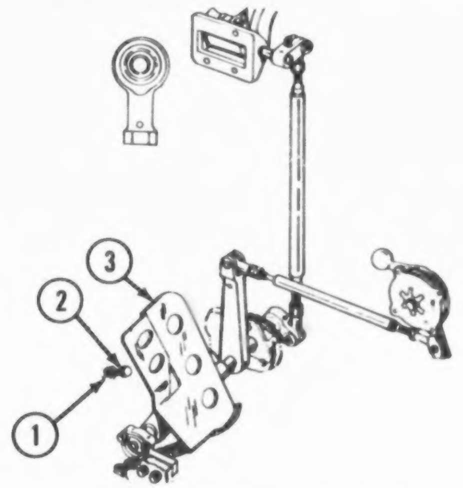
B Insert dowel pin (0.225-inch diameter) in positioning hole (6) in throttle lever and bulkhead.

C Loosen nut (7) and adjust rod length until clevis pin (3) can be easily inserted through rod end (8). Install clevis pin (3) and cotter pin (hidden). Tighten nut (7).

D Start engine with throttle control closed. Engine should be at idle speed (650 rpm).

TA312691

HAND THROTTLE CONTROL ROD AND ACCELERATOR PEDAL: ADJUSTMENT (CONTINUED)



ACCELERATOR PEDAL: ADJUSTMENT

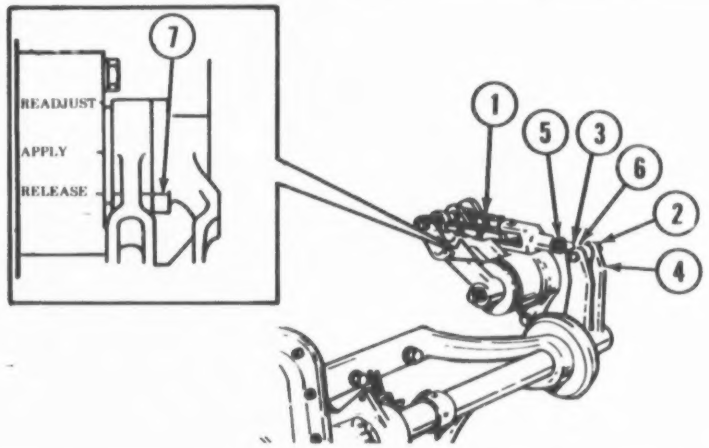
A Ensure hand throttle control adjustment is correct (p 2-76).

B Loosen jam nut (1) and then turn adjusting screw (2) completely in.

C Depress accelerator pedal (3) until it stops. Hold pedal down and turn adjusting screw (2) until it touches the accelerator pedal.

D Tighten jam nuts (1).

SERVICE AND PARKING BRAKE LINKAGE: ADJUSTMENT

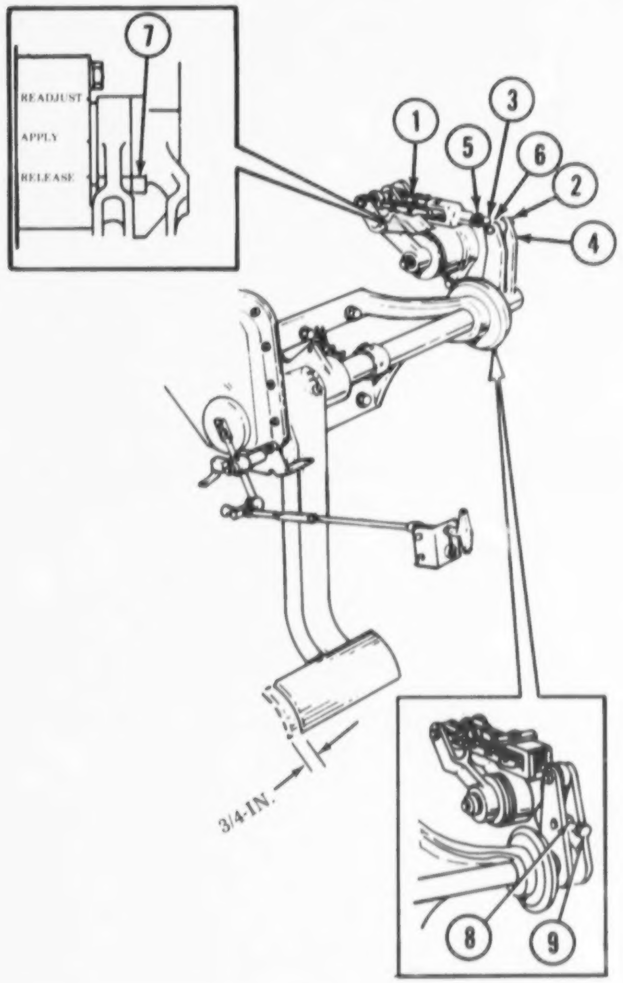


SERVICE BRAKE: ADJUSTMENT

A Release service brake. Check for slack in the sprocket control chain (1). If no slack is present, go to step B. If slack is present, remove cotter pin (2) and clevis pin (3) from brake shaft lever (4). Loosen locknut (5) and turn rod (6) clockwise to shorten. Replace pin (3) and check for slack again. If slack is still present, repeat the above. If no slack, go to step B.

TA310436

SERVICE AND PARKING BRAKE LINKAGE: ADJUSTMENT (CONTINUED)

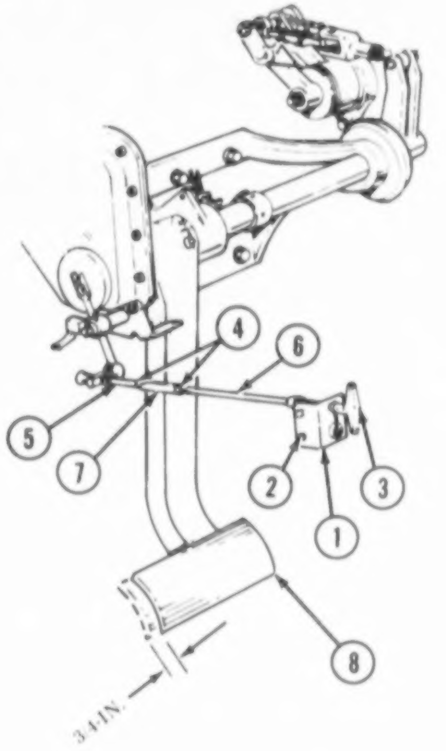


B Check to ensure alinement of brake and apply shaft index mark with release point (7). If linkage alinement is correct, go to step C. If not alined, adjust the length of rod (6) until they are alined.

C After brake adjustment, loosen locknut (8) on brake pedal lever stop screw (9). Adjust brake shaft lever stop screw (9) so that pedal has 3/4-inch free travel. Tighten locknut (8).

TA310437

SERVICE AND PARKING BRAKE LINKAGE: ADJUSTMENT (CONTINUED)



PARKING BRAKE: ADJUSTMENT

A Loosen parking brake (1) by removing screws and lockwashers (2).

B Unlock parking brake handle (3) (up position). Loosen two locknuts (4) on forward brake control rod (5) and rear brake control rod (6).

C Turn connecting nut (7) in either direction until holes in parking bracket (1) aline with mating holes (not shown) and with no pressure applied to bell crank assembly.

D Secure bracket to driver's compartment wall with two screws and two lockwashers (2). Tighten two locknuts (4) on each control rod (5 and 6).

E Depress brake pedal (8). Pull back on parking brake handle (3). Remove foot from pedal. Brake should stay locked. To release parking brake, lift up and in on parking brake handle; then depress and release brake pedal.

TA310438

ENGINE	**ENGINE DOESN'T KEEP STEADY SPEED**

START HERE

1 Check to see if engine coolant is at operating temperature of 170°F.

2 Check accelerator and throttle linkage for loose mounting bolts.

3 Check primary fuel filter. Replace filter element if required (p 4-12).

ENGINE	**ENGINE DOESN'T DEVELOP FULL POWER** **Engine runs slowly and idles roughly.**

START HERE

1 Remove air cleaner filters. Clean if clogged or replace if damaged (p 2-24 and p 4-28).

2 Run STE/ICE Test No. 14 (p 2-48.13).

  a If test passes, go to step 3.
  b If test fails, notify Support Maintenance.

3 Run STE/ICE Test No. 24 (p 2-48.15).

  a If test passes, go to step 4.
  b If test fails, replace fuel pump (p 4-16) and verify no faults.

TA312692

4 Conduct fuel flow test (p 4-22).

5 Run STE/ICE Test No. 13 (p 2-48.10).

   a If test passes verify no faults.
   b If test fails, notify Support Maintenance.

ENGINE	**ENGINE USES TOO MUCH OIL**

START HERE

Check for external oil leaks. Correct cause of leaks if within scope of Organizational Maintenance (Appx B). If not, notify Support Maintenance.

ENGINE	**ENGINE USES TOO MUCH FUEL**

START HERE

1 Inspect fuel tanks, lines, fittings and connections for leaks. Tighten loose fittings and connections. Replace any damaged fuel lines. Notify Direct Support Maintenance to repair fuel tank leaks.

2 Check for dirty air filters. Clean or replace if necessary (p 2-27 and 4-28).

3 If problem still exists, notify Support Maintenance.

TA312693

ENGINE	**BLACK EXHAUST SMOKE IS PRESENT AFTER ENGINE WARM-UP**

START HERE

1 Check air filter for restricted air flow. Clean, repair or replace as necessary (p 2-24 and 4-28).

2 If smoke persists, notify Support Maintenance.

ENGINE	**WHITE EXHAUST SMOKE IS PRESENT**

START HERE

1 Drain and clean fuel filters to remove contaminated fuel (p 4-12).

2 Check radiator for excessive coolant consumption and coolant for oil contamination.

3 Check coolant for oil contamination.

4 If smoke persists, notify Support Maintenance.

TA312694

ENGINE	**EXHAUST FUMES ARE PRESENT IN CREW COMPARTMENT** **Eyes burn and exhaust smell is present.**

START HERE

1 Check for leaks at exhaust connections (p 4-32).

2 Check personnel heater exhaust system (p 14-72).

3 Inspect all clamps and tubes for leaks or damage. Tighten clamps if necessary.

4 Remove engine compartment access cover (p 3-14) and inspect gasket for serviceability.

5 Check APU exhaust system for possible leaks or damage (p 13-13, 13-14, and 13-20).

ENGINE	**ENGINE HAS LOW OR NO OIL PRESSURE**

START HERE

1 Check engine oil level. Level should be between ADD and FULL marks on dipstick (LO 9-2350-267-12).

2 Check for oil leaks (p 5-2). Correct cause of any leaks if within the scope of Organizational Maintenance (Appx B).

3 Run STE/ICE Test No. 50 (idle) (p 2-48.18).

a. If test passes, troubleshoot engine oil pressure gage (p 2-135).
b. If test fails, notify Support Maintenance.

TA312695

ENGINE	ENGINE OVERHEATS

START HERE

1 Check coolant level. Add coolant if necessary (TM 9-2350-267-10).

2 Check cooling fans for proper operation (p 2-18).

3 Check grilles and radiator for clogged air passages. Clean if necessary (p 5-20). Replace radiators if damaged (p 5-21).

4 Check for collapsed hoses (p 5-29). Replace if necessary.

5 Flush cooling system (TM 9-2350-267-10) for draining and filling of the cooling system.

6 Remove and inspect inlet and bypass thermostats. Replace if necessary (p 5-24 and 5-26).

7 Replace pressure relief valve (p 5-18).

8 Troubleshoot engine coolant temperature indicator circuit (p 2-130).

TA310443

TRANSMISSION AND DRIVING CONTROLS	**TRANSMISSION OVERHEATS** **TRANSMISSION OIL TEMP gage is over/under 270°F. Master warning light is lit.**

START HERE

1 Check oil level and add oil if necessary (LO 9-2350-267-12).

2 Adjust brakes (p 7-40).

3 Check transmission oil filter for cleanliness and proper installation (p 7-9).

4 Check transmission oil pressure (p 7-1). If below specified pressure, notify Support Maintenance.

TRANSMISSION AND DRIVING CONTROLS	**VEHICLE DOESN'T DRIVE** **Transmission doesn't operate in any shift position.**

START HERE

1 Check for improperly adjusted or disconnected shift control linkage. Connect linkage or adjust properly (p 2-87 and 7-34).

2 Check brake linkage (p 7-40) and transmission internal brake adjustment (p 7-38). Adjust as required.

TA310444

3 Check oil level and add as required (LO 9-2350-267-12). If oil level is low, check transmission seals, plugs and gaskets for oil leaks. Correct cause of leaks if within scope of Organizational Maintenance (Appx B). If repairs are beyond scope of Organizational Maintenance, notify Support Maintenance.

4 Check transmission oil pressures (p 7-1). If below specified pressure, notify Support Maintenance.

5 Check for broken universal joints. If broken, replace (p 8-32).

6 Road test vehicle to ensure problem is corrected.

TA310445

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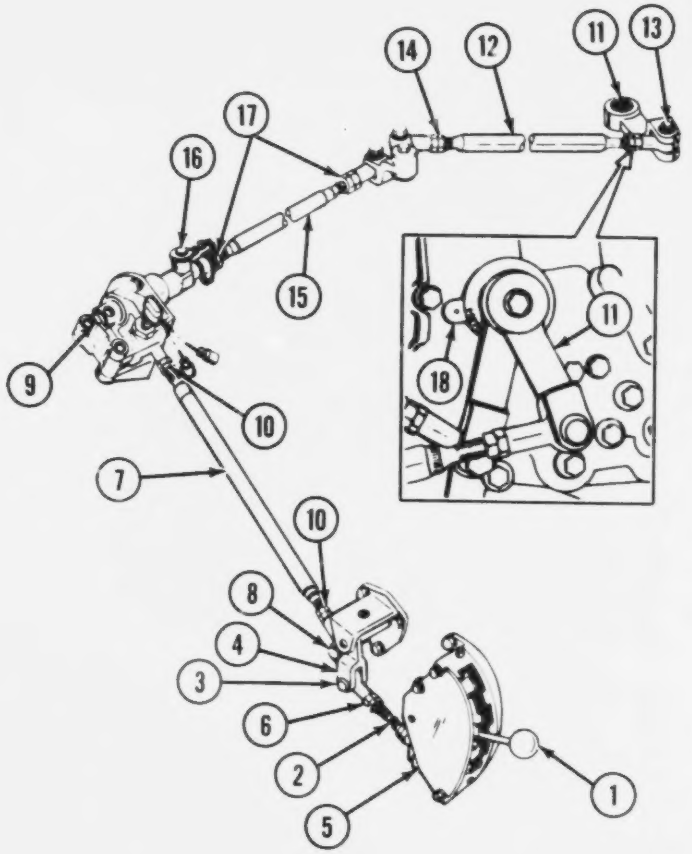
TRANSMISSION SHIFT CONTROL LINKAGE: ADJUSTMENT



A Place shift control lever (1) in neutral (N) position. Disconnect shift control inner rod (2) by removing cotter pin, flat washer and clevis pin (3) from shift control inner bell crank (4).

B Place bell crank (4) parallel with lever on shift control (5). Loosen nut (6) and adjust shift control inner rod (2) until clevis pin (3) can be installed easily. Install flat washer and cotter pin. Tighten nut (6).

C Disconnect shift control inner tube (7) by removing cotter pin, flat washer and clevis pin (8). With base lever (9) at neutral position on neutral safety switch (verify by attempting to crank engine after fuel shutoff has been pulled) and with shift lever in neutral position, loosen nuts (10). Adjust shift control inner tube (7) until clevis pin (8) can be easily inserted into lever of inner bell crank (4). Install flat washer and cotter pin. Tighten nut (10) on shift control inner tube (7).

D With shift control lever (11) in neutral (N) position, check indicator (18), disconnect shift control outer rod (12) from transmission shift control lever (11) by removing cotter pin, flat washer and clevis pin (13). Loosen nuts (14) and adjust rod to approximately 8-1/4 inches (centerline of bearing bore to centerline of bearing bore). Tighten nuts (14).

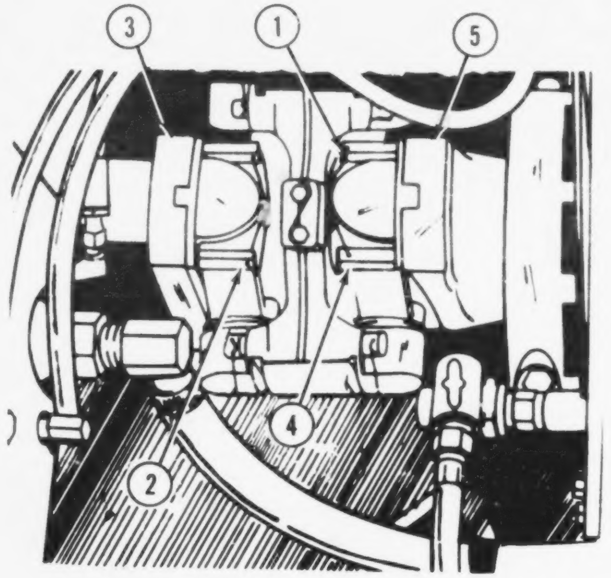
E Disconnect shift control outer tube (15) by pulling quick-disconnect pin (16). Make sure control lever (11) is in neutral position and install shift control rod (12) in transmission shift control lever (11). Install clevis pin, flat washer and cotter pin (13).

F Loosen nut (17) and adjust shift control outer tube (15) until quick-disconnect pin (16) can be easily inserted. Tighten nuts on shift control outer tube.

G Move shift control lever (1) through all positions. In each position, check to see that transmission shift control lever indicator (18) indicates the same as the shift control lever position.

TA310446

UNIVERSAL JOINTS: REMOVAL AND INSTALLATION



REMOVAL

A Open transmission access door.

B Remove lock wires (1).

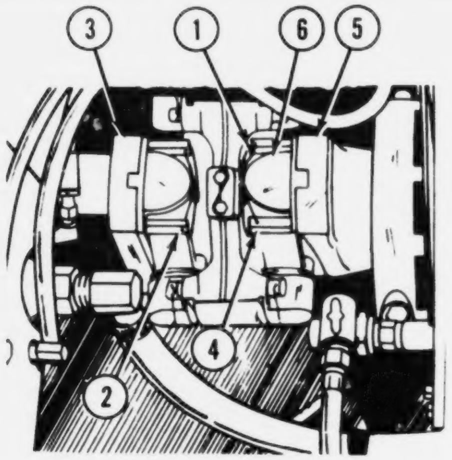
NOTE

If flange and adapter screws are inaccessible, place transmission shift lever in neutral (N) and push or tow vehicle until universal joint rotates sufficiently to allow access to screws.

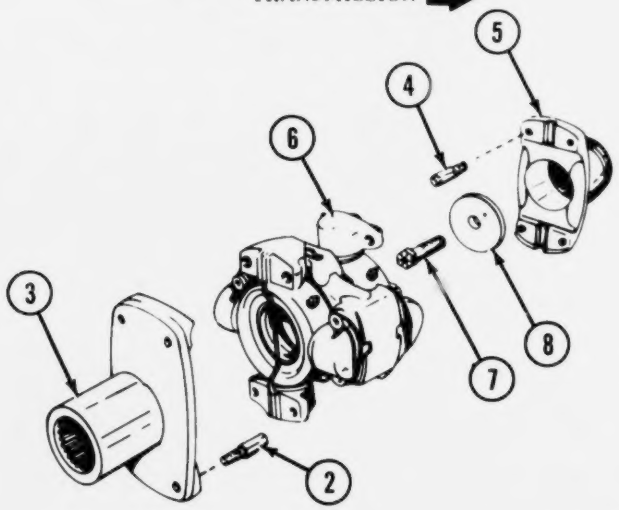
C Remove four screws (2) at flange assembly (3) and four screws (4) at adapter (5).

TA310447

UNIVERSAL JOINTS: REMOVAL AND INSTALLATION (CONTINUED)



FINAL DRIVE
TRANSMISSION



D Slide flange assembly (3) toward final drive, and adapter (5) toward transmission. Lift out spider, plate, bumper and retainer group (6).

E Slide flange assembly (3) off final drive.

F Remove screw (7) and plate (8). Slide adapter (5) off transmission.

INSTALLATION

A Install plate (8) and screw (7) into adapter (5) and slide on transmission.

B Slide flange assembly (3) on final drive.

C Hold spider, plate, bumper and retainer group (6) and mate with adapter (5) and flange assembly (3).

CAUTION

Lock wires must be used to secure screws, otherwise serious damage can result.

D Install eight screws (2 and 4) and lock wires (1).

E Close transmission access door.

TA310448

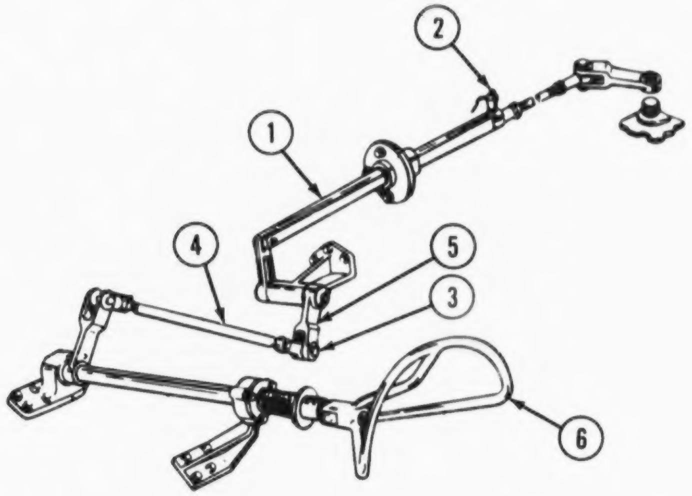
TRANSMISSION and DRIVING CONTROLS	VEHICLE DOESN'T STEER IN EITHER DIRECTION IN ANY RANGE

START HERE

1 Check for broken or disconnected steering linkage. Connect steering linkage (p 7-11).

2 Check transmission oil level (LO 9-2350-267-12).

STEERING CONTROL LINKAGE: ADJUSTMENT



NOTE

Centerline of steer shaft rod lever must be in line with transmission shaft pointer.

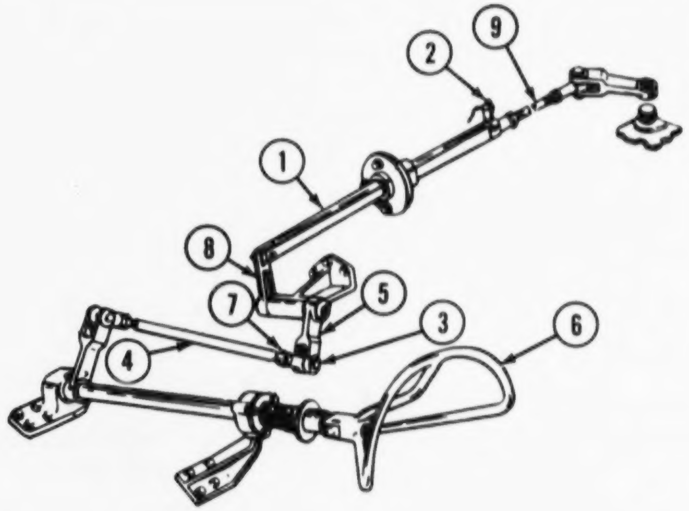
A Disconnect sliding steer shaft (1) by removing quick-disconnect pin (2).

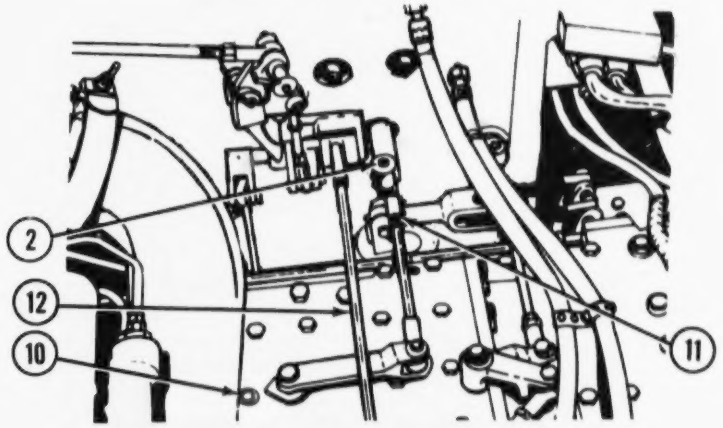
B Remove cotter pin, flat washer, and clevis pin (3) to disconnect rod (4) from steer relay rear lever (5).

C Place steering wheel (6) in straight steer driving position (center spoke of steering wheel vertical).

TA310449

STEERING CONTROL LINKAGE: ADJUSTMENT (CONTINUED)





D Loosen rod end locknut (7) on rod (4). Adjust rod length until steer relay front lever (8) is vertical (parallel to the adjacent bulkhead).

NOTE

Use new cotter pin(s).

E Reinstall clevis pin, flat washer and cotter pin (3), and tighten rod end locknut (7).

F With transmission sliding steer shaft rod lever (9) in straight steer position (pointer on transmission steer points to center mark on screw (10) and steering wheel in straight driving position, loosen sliding steer shaft rod end locknut (11) and adjust rod until quick-disconnect pin (2) can be easily inserted through sliding steer shaft (12) with rod end in place.

G Install quick-disconnect pin (2) and tighten sliding steer shaft rod end locknut (11).

H Check adjustment by turning steering wheel (6) and observing transmission sliding steer shaft rod lever (9) which should rotate in the opposite direction of the steering wheel to full right or left steer.

TA310450

TRANSMISSION AND DRIVING CONTROLS	VEHICLE STEERS IN ONE DIRECTION ONLY

START HERE

1 Check steering control linkage adjustment (p 7-44).

2 Check transmission oil pressure (p 7-1). If below specified pressure, notify Support Maintenance.

TRACKS AND SUSPENSION	VEHICLE BRAKES POORLY Vehicle doesn't stop correctly when brake is used.

START HERE

1 Check for improperly adjusted brakes. Adjust if necessary (p 7-40).

2 Check for faulty brake linkage. Replace brake linkage if defective (p 7-16 thru 7-21).

TA310451

TRACKS AND SUSPENSION	VEHICLE PULLS TO ONE SIDE WITH STEERING WHEEL IN CENTER POSITION

START HERE

NOTE

Crown on road causes vehicle to pull away from center of road. Road test vehicle.

1 Check for disconnected or improperly adjusted steering control linkage (p 7-44).

2 Check brakes. Adjust if necessary (p 7-40).

3 Check track and suspension (p 2-9).

4 Check for worn drive sprocket (p 2-12).

TA310452

TRACKS AND SUSPENSION	**VEHICLE THROWS TRACKS**

START HERE

NOTE

Improper driving or operation of vehicle (high-speed turns) causes vehicle to throw track (TM 9-2350-267-10).

1 Check for loose or worn track. Replace as required (p 2-14).

2 Check for broken torsion bars. Replace if broken (p 2-12).

TRACKS AND SUSPENSION	**SUSPENSION SYSTEM IS NOISY DURING OPERATION**

START HERE

1 Immediately after operating vehicle, check roadwheel hubs for excessive heat (p 2-9).

2 Check for excessive sprocket tooth wear. Reverse or replace (p 2-12).

3 Check for worn track shoes (p 2-14).

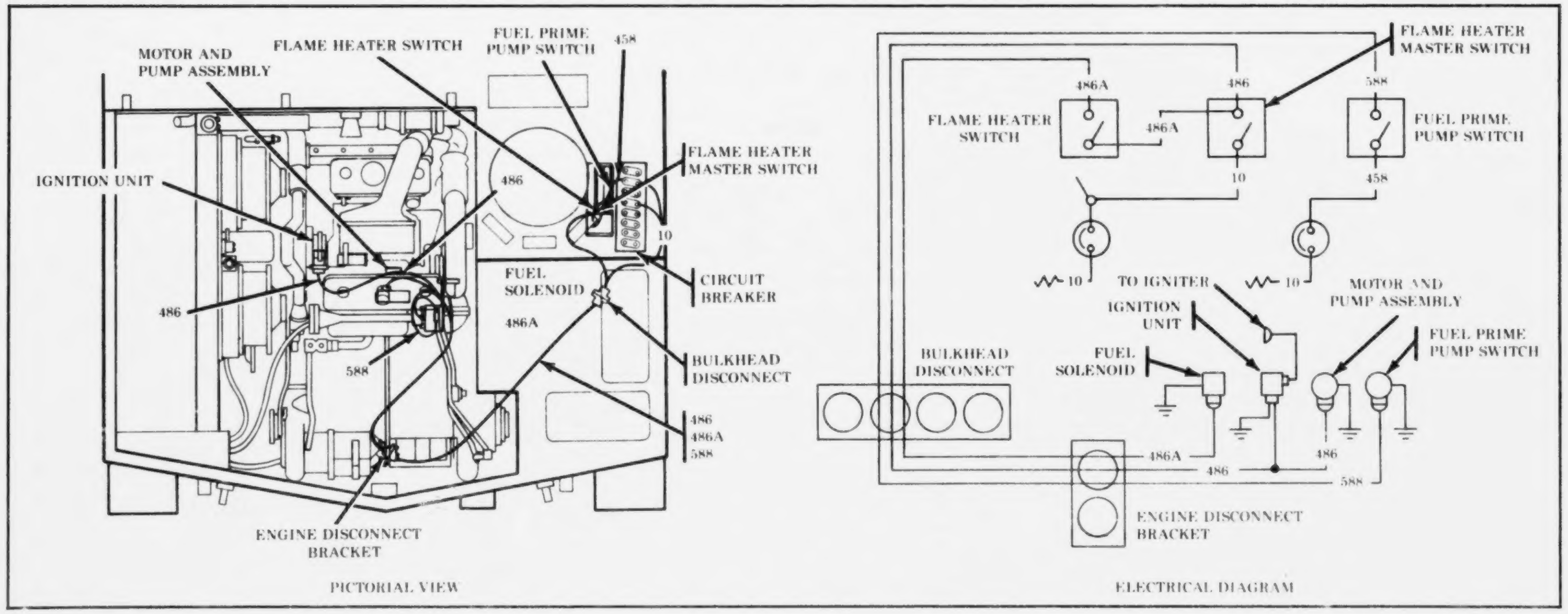
TA310453

FLAME HEATER	**FLAME HEATER DOESN'T OPERATE** **Motor and pump assembly doesn't operate. Do steps A through G.** **Fuel solenoid doesn't operate. Do steps H through K.** **Ignition unit doesn't operate. Do steps Q through S.**

START HERE

With switch ON and FUEL SHUTOFF pulled, crank engine. A small amount of smoke should come out of exhaust when FLAME HEATER is turned ON. If not, troubleshoot flame heater circuit.

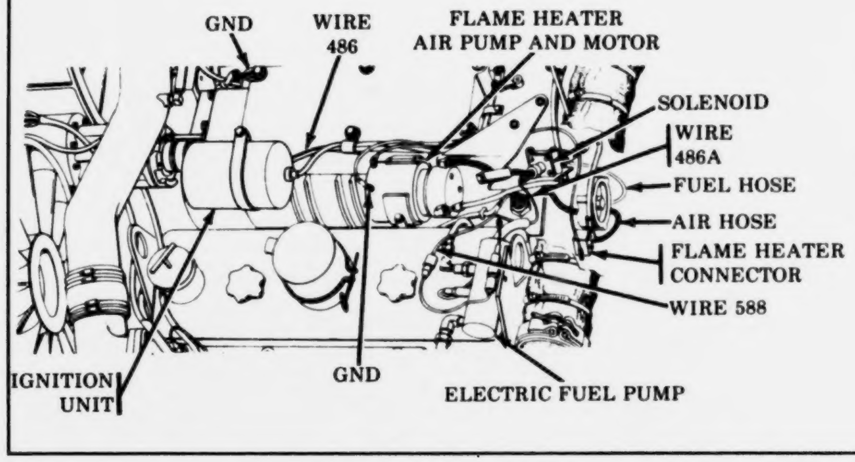
FLAME HEATER CIRCUIT


MOTOR AND PUMP ASSEMBLY
FLAME HEATER SWITCH
FUEL PRIME PUMP SWITCH
458
FLAME HEATER MASTER SWITCH
IGNITION UNIT
486
10
CIRCUIT BREAKER
FUEL SOLENOID
486A
486
588
BULKHEAD DISCONNECT
486
486A
588
ENGINE DISCONNECT BRACKET
FLAME HEATER MASTER SWITCH
486A
486
588
FLAME HEATER SWITCH
486A
FUEL PRIME PUMP SWITCH
10
458
10
TO IGNITER
10
MOTOR AND PUMP ASSEMBLY
IGNITION UNIT
FUEL PRIME PUMP SWITCH
BULKHEAD DISCONNECT
FUEL SOLENOID
486A
486
486
588
ENGINE DISCONNECT BRACKET

PICTORIAL VIEW

ELECTRICAL DIAGRAM

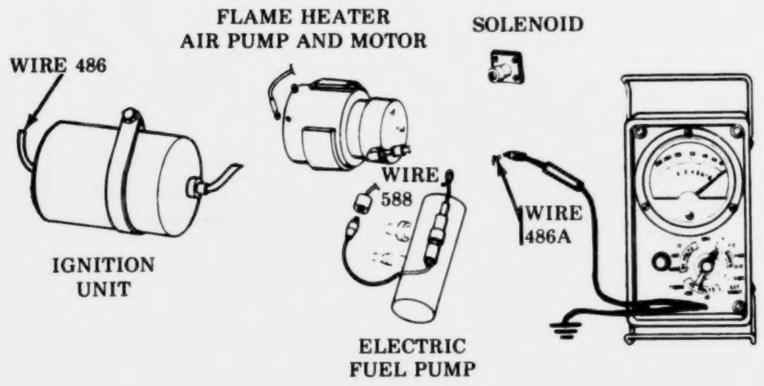
TA310454


GND
WIRE 486
FLAME HEATER AIR PUMP AND MOTOR
SOLENOID
WIRE 486A
FUEL HOSE
AIR HOSE
FLAME HEATER CONNECTOR
WIRE 588
IGNITION UNIT
GND
ELECTRIC FUEL PUMP

A Disconnect wire 486A from flame heater solenoid, wire 486 from flame heater air pump and motor assembly, wire 486 from ignition unit and wire 588 at electrical fuel pump.

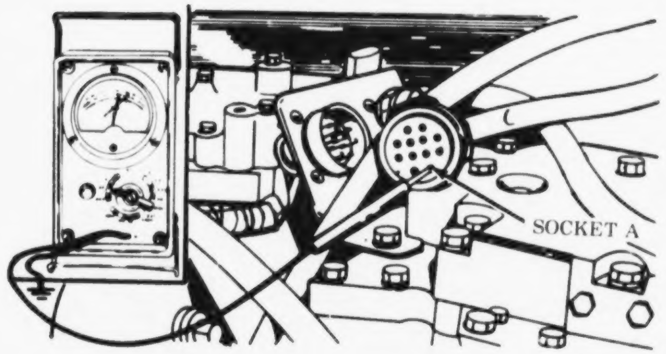
NOTE

MASTER switch ON, steps B-S.

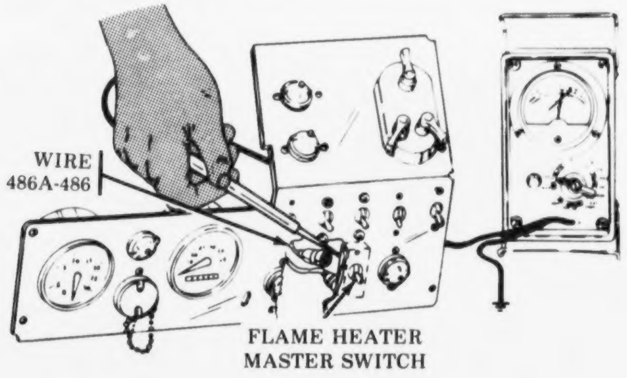

WIRE 486
FLAME HEATER AIR PUMP AND MOTOR
SOLENOID
WIRE 588
WIRE 486A
IGNITION UNIT
ELECTRIC FUEL PUMP

B Multimeter red lead in wire 486A, black lead to ground. Place MASTER switch and FLAME HEATER switch to ON, test for voltage. Repeat voltage checks for both wires 486 and 588. If no voltage on wire 486 to pump and motor assembly, go to step C. If no voltage on wire 486A (solenoid), go to step H. If no voltage on wire 486 (ignition unit), go to step K. If no voltage on wire 588 (electric fuel pump), go to step L.

TA310455

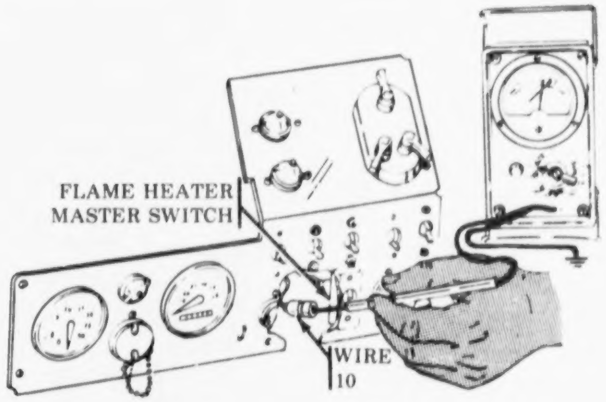


C Disconnect connector at engine disconnect bracket. Place red multimeter lead in socket A. Ground black lead and check for voltage. If voltage to ignition unit is present, repair or replace wire 486 from engine disconnect bracket to motor and pump assembly (p 6-64). If no voltage, go to step D.

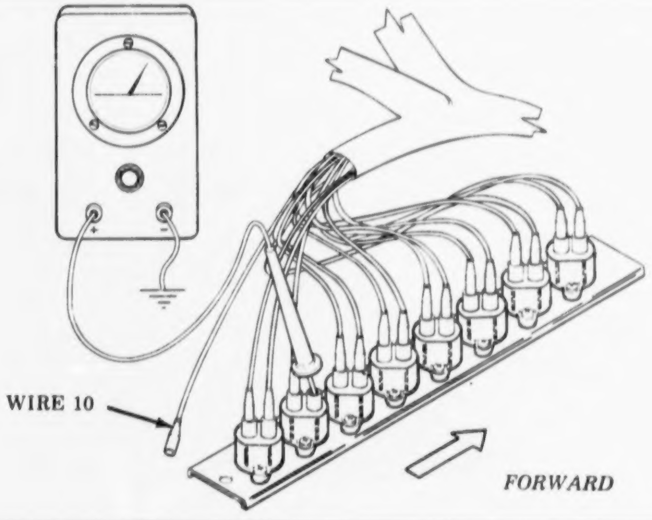


D Disconnect wire 486A and 486 from FLAME HEATER MASTER switch output. With FLAME HEATER MASTER switch ON, check switch for voltage by placing red lead in switch and black lead to ground. If no voltage, go to step E. If voltage is present, repair or replace wire 486 from FLAME HEATER MASTER switch to engine disconnect bracket (Appx F).

TA310456

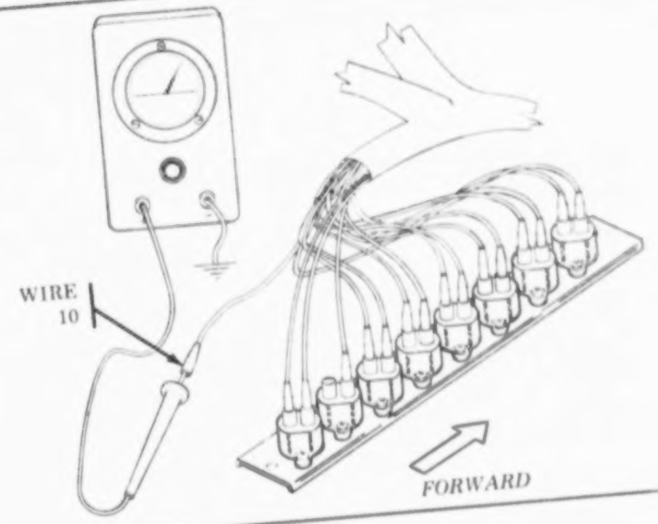


E Disconnect wire 10 at FLAME HEATER MASTER switch. Check for voltage by placing red multimeter lead on wire 10 and black lead to ground. If not voltage, go to step F. If voltage is present, replace FLAME HEATER MASTER switch.

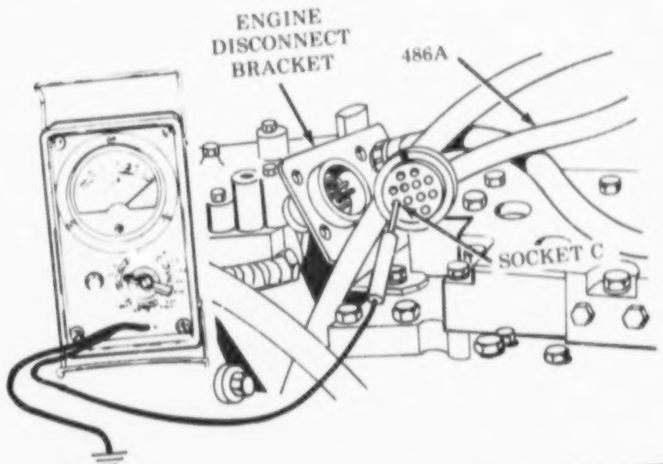


F Disconnect wire 10 at circuit breaker output. Check circuit breaker for voltage by placing red multimeter lead in circuit breaker output and black lead to ground. If voltage is present, repair or replace wire 10 to FLAME HEATER MASTER switch (Appx F). If no voltage is present, go to step G.

TA310457

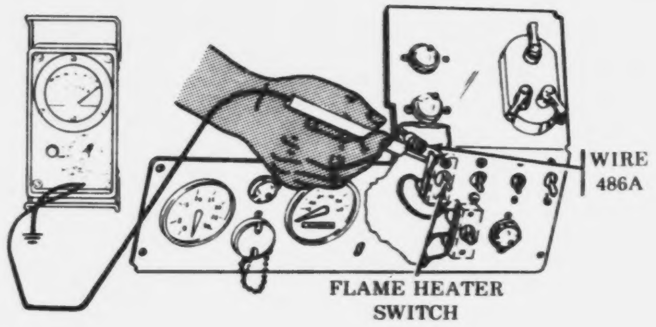


G Disconnect wire 10 at circuit breaker input and check wire 10 for voltage by placing red lead of multimeter in wire and black lead to ground. If voltage is present, replace circuit breaker (p 6-54). If voltage is not present, repair wire 10 feed circuit from bulkhead disconnect to circuit breaker (p 6-77).

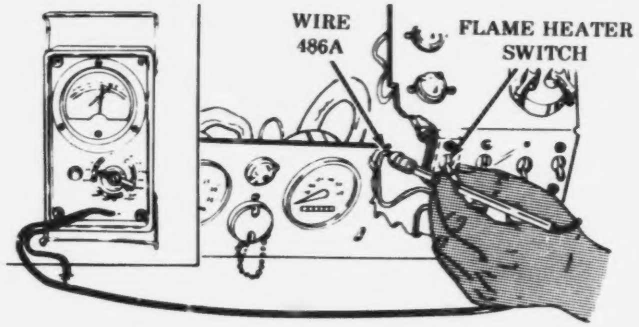


H Disconnect wire 486A at engine disconnect bracket. Check for voltage in socket C by placing red multimeter lead in socket C and black lead to ground. If voltage is present, repair or replace wire 486A from engine disconnect bracket to fuel solenoid (Appx F). If no voltage, go to step I.

TA310458

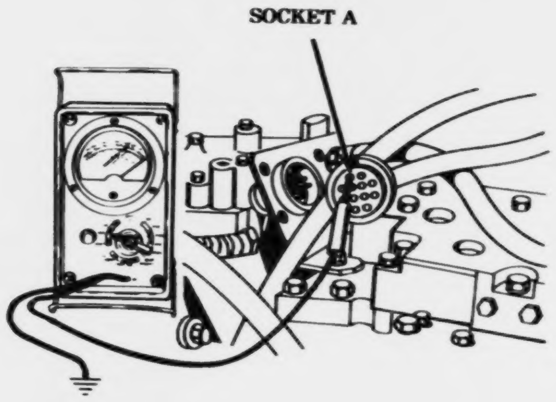


I Disconnect wire 486A at FLAME HEATER switch output. With FLAME HEATER switch ON, check switch for voltage by placing red multimeter lead in switch and black lead to ground. If voltage is present, repair or replace wire 486A from FLAME HEATER switch to engine disconnect bracket (Appx F). If no voltage is present, go to step J.

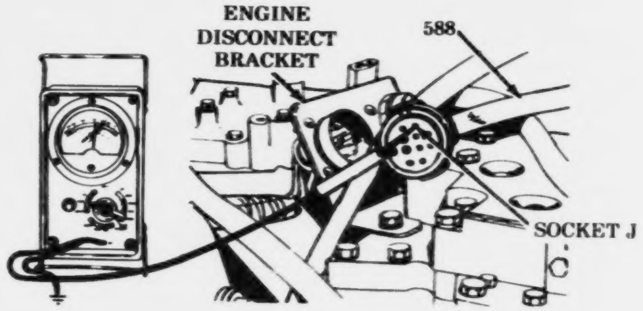


J Disconnect wire 486A at FLAME HEATER switch input and check for voltage. Place red multimeter lead in wire 486A and black lead to ground. If voltage is present, replace FLAME HEATER switch (p 6-19). If no voltage, repair or replace wire 486A from FLAME HEATER switch to FLAME HEATER MASTER switch (Appx F).

TA310459

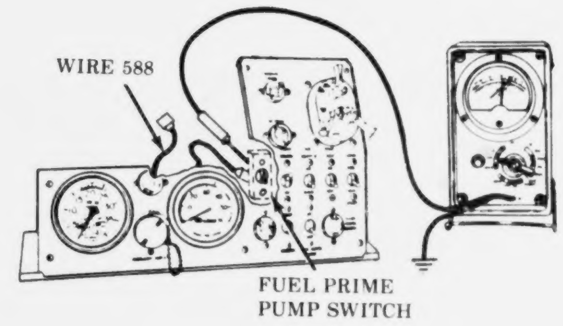


K Disconnect wire 486 at engine disconnect bracket and check socket A for voltage. Place red multimeter lead in socket A and black lead to ground. If voltage is present, repair or replace wire 486 from engine disconnect bracket to ignition unit (Appx F). If no voltage, repair or replace wire 486 from FLAME HEATER MASTER switch to engine disconnect bracket (Appx F).

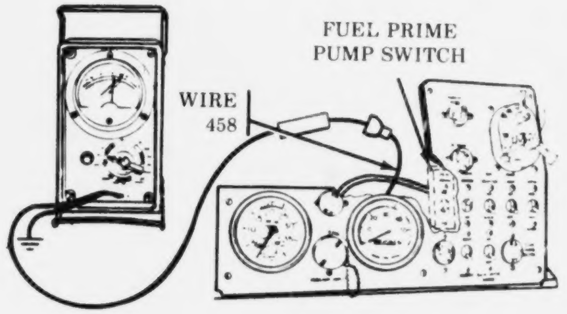


L Disconnect wire 588 at engine disconnect bracket. Multimeter red lead in socket J and black lead to ground. Fuel prime pump switch to ON position and check for voltage. If voltage is present, repair or replace wire 588 from engine disconnect bracket to fuel prime pump (Appx F). If voltage is not present, go to step M.

TA310460

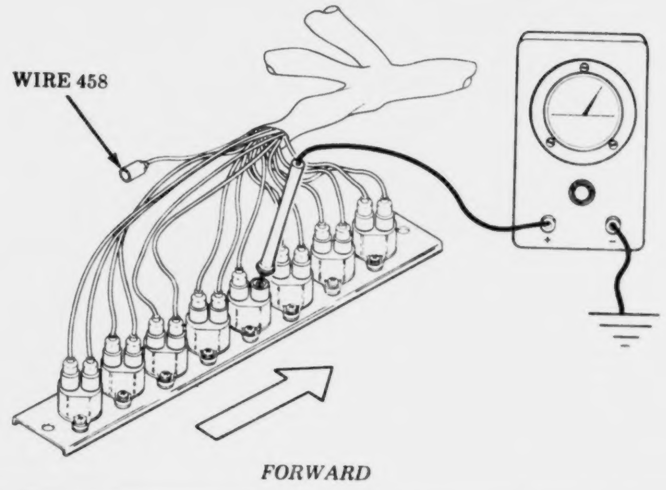

WIRE 588
FUEL PRIME
PUMP SWITCH

M Disconnect wire 588 from fuel prime pump switch. Multimeter red lead in switch output and black lead to ground. Fuel prime pump switch to ON and check for voltage. If voltage is present, repair or replace wire 588 from switch to engine disconnect bracket (Appx F). If voltage is not present, go to step N.

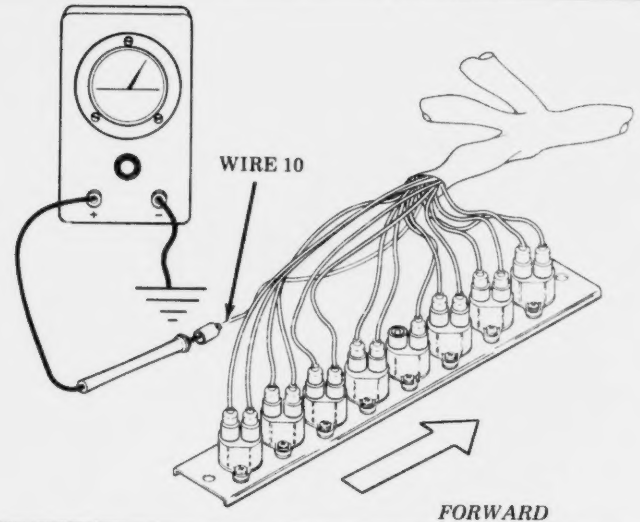

FUEL PRIME
PUMP SWITCH
WIRE
458

N Disconnect wire 458 from fuel prime pump switch input. Multimeter red lead in wire 458, and black lead to ground. Check for voltage. If voltage is present, replace fuel prime pump switch (p 6-19). If voltage is not present, go to step O.

TA310461

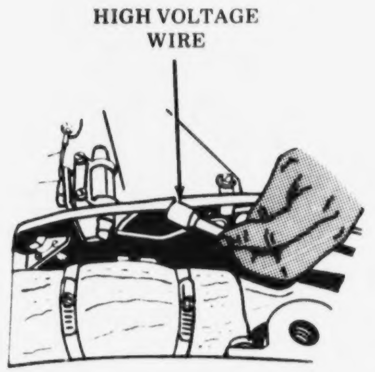


O Disconnect wire 458 from circuit breaker output. Multimeter red lead in circuit breaker output and black lead to ground. Check for voltage. If voltage is present, replace or repair wire 458 (Appx F). If voltage is not present, go to step P.



P Disconnect wire 10 from circuit breaker input. Multimeter red lead on wire 10 and black lead to ground. Check for voltage. If voltage is present, replace circuit breaker (p 6-54). If voltage is not present, troubleshoot master relay circuit (p 2-63).

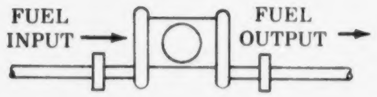
TA310462



WARNING

If fuel vapors are present, do not do step Q.

Q Disconnect high voltage wire from igniter and hold wire 1/4-inch from ground. Place FLAME HEATER MASTER switch ON. If spark fails to jump 1/2-inch gap, notify Support Maintenance.

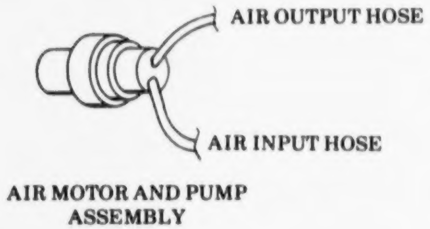


CAUTION

Use a container to catch any fuel that may flow through the input hose.

R Disconnect fuel input hose at solenoid. Place FLAME HEATER switch and fuel prime pump switch ON. If fuel flows freely, replace solenoid. If fuel does not flow, notify Support Maintenance.

TA310463


AIR OUTPUT HOSE
AIR INPUT HOSE
AIR MOTOR AND PUMP ASSEMBLY

S Disconnect air output hose at the motor and pump assembly. Place FLAME HEATER MASTER switch ON. If air does not flow from the port, notify Support Maintenance.

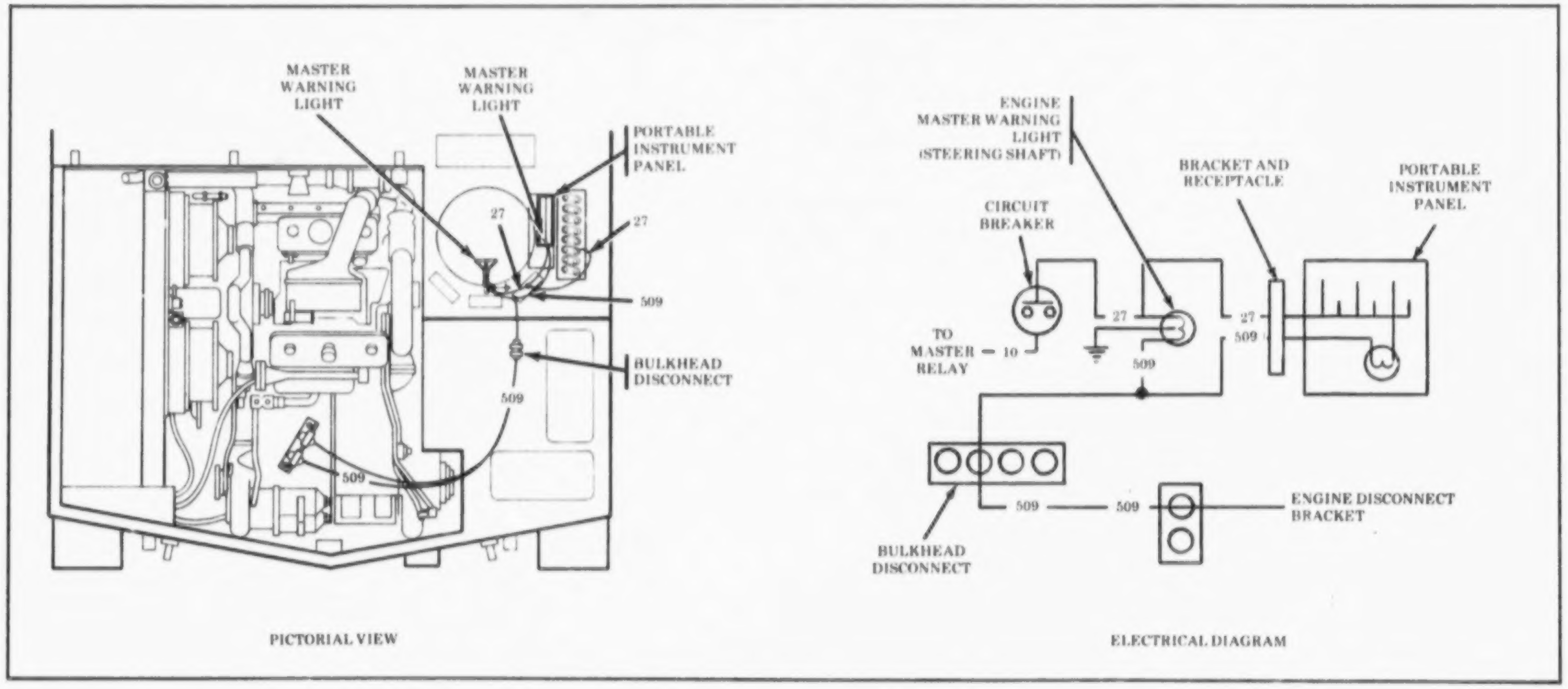
TA310464

ENGINE MASTER WARNING LIGHT (STEERING SHAFT)	**STEERING SHAFT MASTER WARNING LIGHT DOESN'T LIGHT** Do steps A and B. **STEERING SHAFT MASTER WARNING LIGHT DOESN'T LIGHT WHEN PRESS-TO-TEST IS PERFORMED** Do step C.

START HERE

Troubleshoot engine MASTER WARNING light circuit.

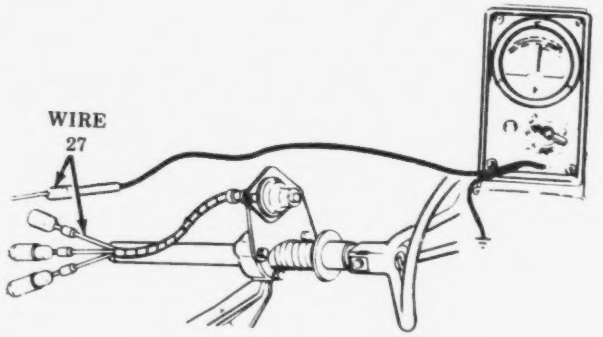
MASTER WARNING LIGHT CIRCUIT


MASTER WARNING LIGHT
MASTER WARNING LIGHT
PORTABLE INSTRUMENT PANEL
27
27
509
BULKHEAD DISCONNECT
509
509
ENGINE MASTER WARNING LIGHT (STEERING SHAFT)
BRACKET AND RECEPTACLE
PORTABLE INSTRUMENT PANEL
CIRCUIT BREAKER
TO MASTER RELAY
10
27
509
27
509
BULKHEAD DISCONNECT
509
509
ENGINE DISCONNECT BRACKET

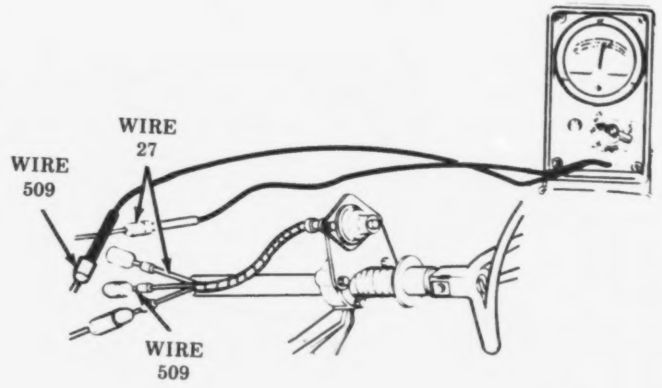
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310465

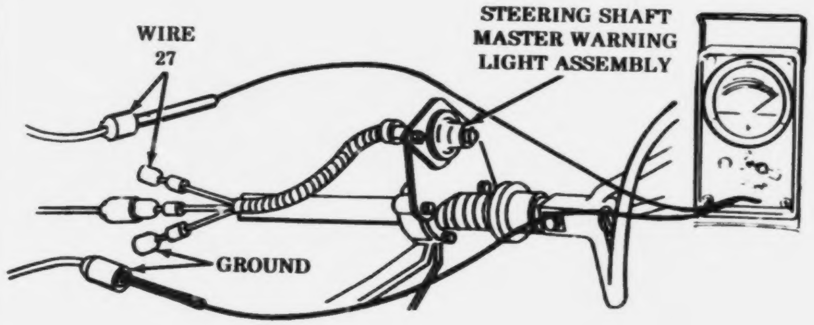


A Disconnect wire 27 from MASTER WARNING light. Then turn MASTER switch ON. Using multimeter set on dc volts scale, place red lead in wire 27 and ground black lead to hull. If voltage is present, go to step B. If no voltage, repair or replace wire 27 (p 6-84).



B Disconnect wire 509 from MASTER WARNING light. With red multimeter lead in wire 27, place black lead in wire 509. If voltage is present, replace bulb (p 7-53). If no voltage, repair wire 509 (p 6-84).

TA310466


WIRE
27
STEERING SHAFT
MASTER WARNING
LIGHT ASSEMBLY
GROUND

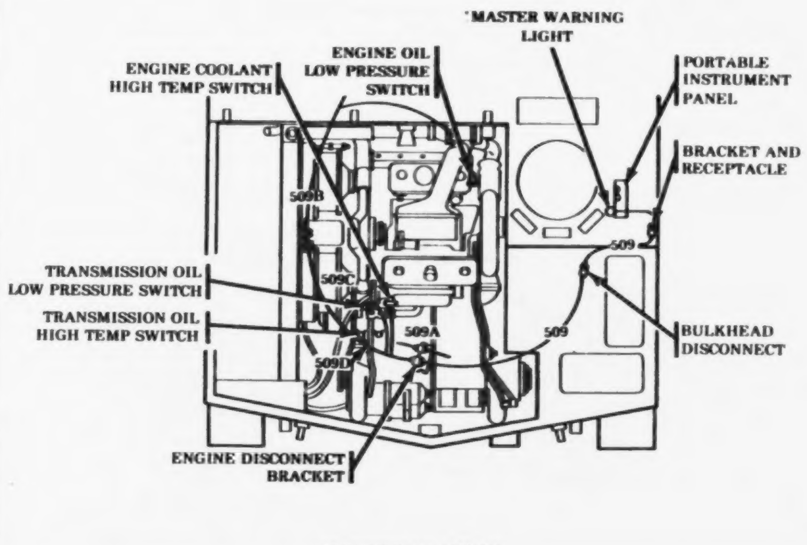
C Disconnect wire 27 and ground wire from MASTER WARNING light. Using multimeter, place red lead in wire 27 and black lead in ground wire. If voltage is present, replace steering shaft MASTER WARNING light assembly (p 7-53). If no voltage, repair or replace ground wire (p 6-84).

TA310467

ENGINE **MASTER WARNING LIGHT** **(PORTABLE INSTRUMENT PANEL)**	**MASTER WARNING LIGHT DOESN'T LIGHT** **Do steps A and B.** **MASTER switch is ON and engine is off, but MASTER WARNING light isn't on.** **MASTER WARNING LIGHT IS ON** **Do steps C through F.** **Everything appears normal, but MASTER WARNING light is on.**

START HERE → Troubleshoot engine MASTER WARNING light circuit.

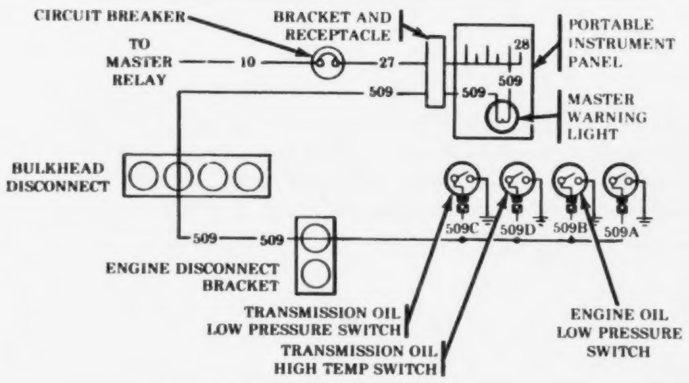
MASTER WARNING LIGHT CIRCUIT


MASTER WARNING LIGHT
ENGINE OIL LOW PRESSURE SWITCH
ENGINE COOLANT HIGH TEMP SWITCH
PORTABLE INSTRUMENT PANEL
BRACKET AND RECEPTACLE
509B
509
509C
TRANSMISSION OIL LOW PRESSURE SWITCH
TRANSMISSION OIL HIGH TEMP SWITCH
509A
509
509D
BULKHEAD DISCONNECT
ENGINE DISCONNECT BRACKET

PICTORIAL VIEW

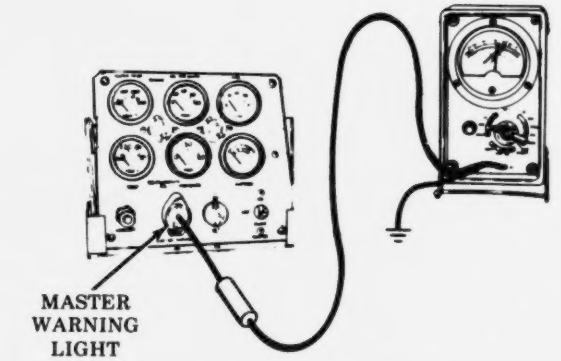
WARNING

When working in the power pack compartment with engine running, use extreme care. Wear appropriate protective devices and clothing. Keep hands clear of moving parts.

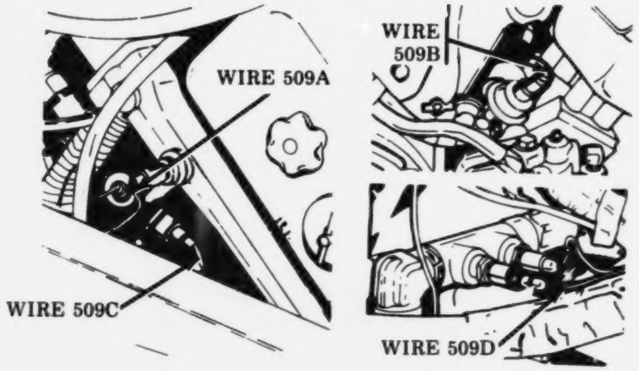

CIRCUIT BREAKER
BRACKET AND RECEPTACLE
PORTABLE INSTRUMENT PANEL
TO MASTER RELAY
10
27
28
509
509
509
MASTER WARNING LIGHT
BULKHEAD DISCONNECT
509C
509D
509B
509A
509
509
ENGINE DISCONNECT BRACKET
TRANSMISSION OIL LOW PRESSURE SWITCH
TRANSMISSION OIL HIGH TEMP SWITCH
ENGINE OIL LOW PRESSURE SWITCH

ELECTRICAL DIAGRAM

TA310468

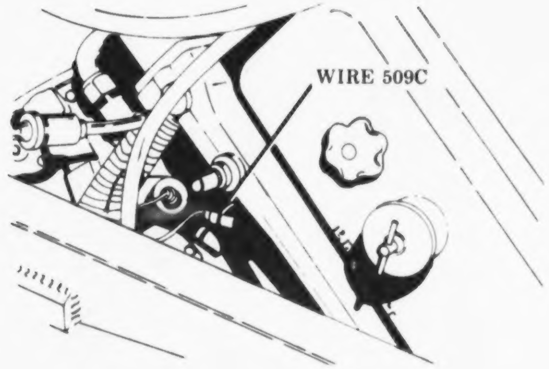

MASTER
WARNING
LIGHT

A Remove bulb from MASTER WARNING light. Turn MASTER switch ON. Put red multimeter lead in center contact, ground black lead and check voltage. If no voltage, troubleshoot wire 509 from center contact to junction of wires 509 and 27-28-40A (p 6-89). If voltage is present, go to step B. Repair if required.

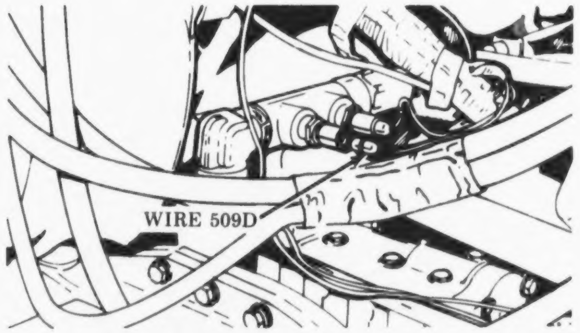

WIRE 509A
WIRE 509C
WIRE
509B
WIRE 509D

B Place a good bulb in MASTER WARNING light socket. If bulb lights, old bulb was bad and the wiring is good.

TA310469

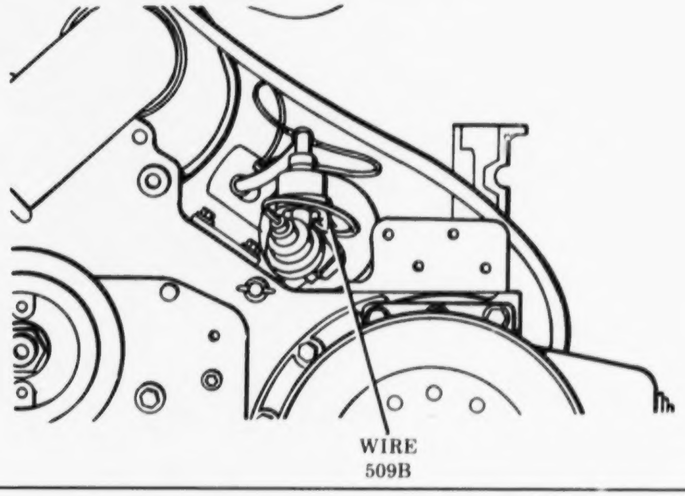


C Start engine and disconnect wire 509C while watching MASTER WARNING light. If light goes out, replace transmission oil low pressure switch (p 6-12). If light stays on, go to step D.

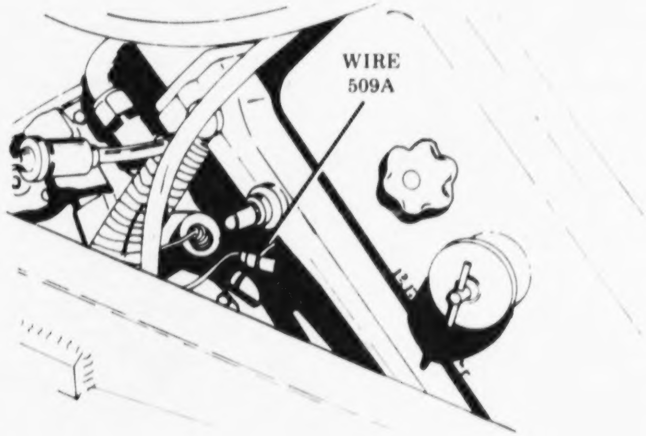


D With engine operating, disconnect wire 509D while observing MASTER WARNING light. If light goes out, replace transmission oil high temperature switch (p 6-11). If light continues to burn, go on to step E.

TA310470



E Remove engine compartment access cover. With engine running, disconnect wire 509B. If MASTER WARNING light goes out, replace engine oil low pressure switch (p 6-10). If light continues to burn, go to step F.



NOTE

To trace circuit 509, check wiring harnesses 12268102 (p 6-64), 12268100 (p 6-68), 12260287 (p 6-84), and 12260298 (p 6-89).

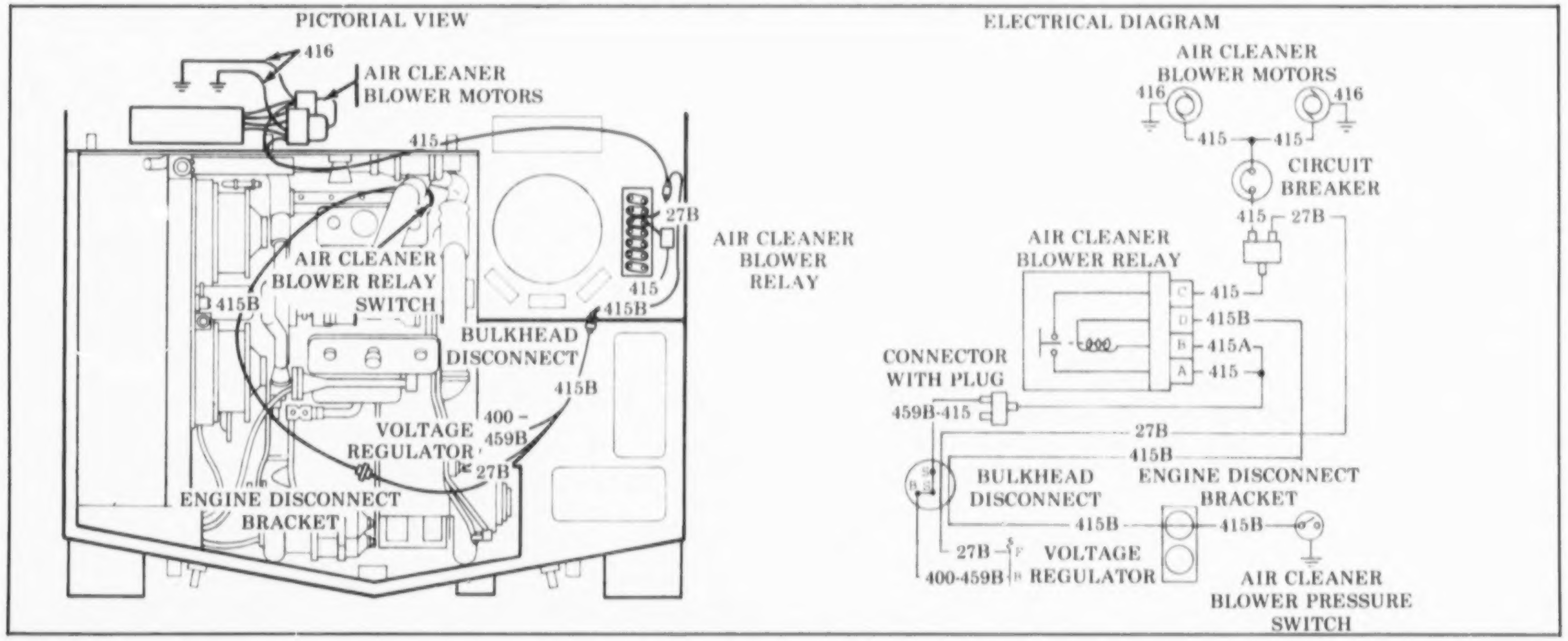
F With engine running, disconnect wire 509A. If MASTER WARNING light goes out, replace engine coolant high temperature switch (p 6-9). If light continues to burn, troubleshoot 509 circuit.

TA310471

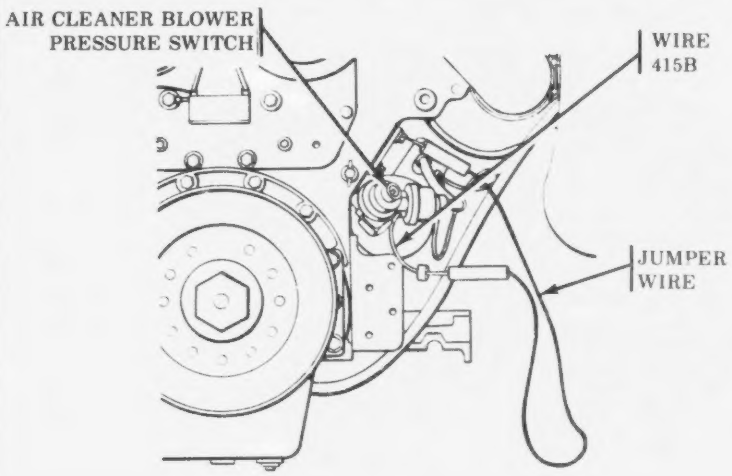
AIR CLEANER DUST EXHAUSTER MOTOR	**MOTOR DOESN'T OPERATE** **Do steps A through H. Engine is running, but dust exhaust motor doesn't operate** **MOTOR DOESN'T STOP** **Do steps I and J. Engine is off and MASTER switch is ON, and motor runs.** **ONE BLOWER MOTOR DOESN'T OPERATE** **Do step K.**

START HERE Troubleshoot air cleaner blower motor circuit.

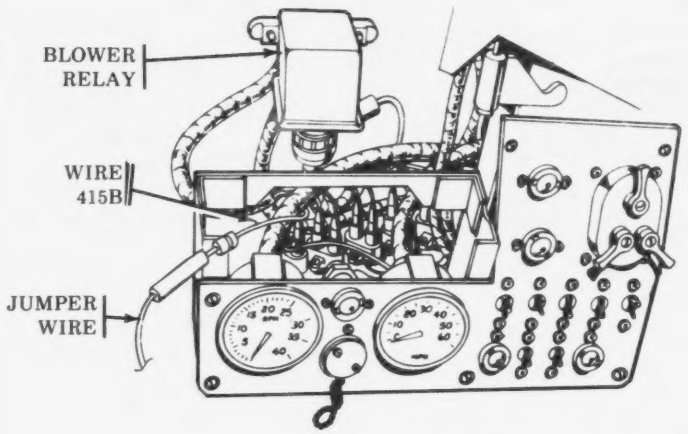
AIR CLEANER BLOWER MOTOR CIRCUIT


PICTORIAL VIEW
416
AIR CLEANER BLOWER MOTORS
415
27B
AIR CLEANER BLOWER RELAY SWITCH
415B
415
415B
BULKHEAD DISCONNECT
415B
400-459B
VOLTAGE REGULATOR
27B
ENGINE DISCONNECT BRACKET
AIR CLEANER BLOWER RELAY
ELECTRICAL DIAGRAM
AIR CLEANER BLOWER MOTORS
416
416
415
415
CIRCUIT BREAKER
415
27B
AIR CLEANER BLOWER RELAY
C 415
D 415B
B 415A
A 415
CONNECTOR WITH PLUG
459B-415
27B
415B
BULKHEAD DISCONNECT
ENGINE DISCONNECT BRACKET
415B
415B
27B
F
VOLTAGE REGULATOR
400-459B
B
AIR CLEANER BLOWER PRESSURE SWITCH

TA310472


AIR CLEANER BLOWER PRESSURE SWITCH
WIRE 415B
JUMPER WIRE

A Remove engine compartment access cover (p 3-14). Disconnect wire 415B from air cleaner blower pressure switch. Turn MASTER switch ON and use jumper wire to ground wire 415B. If blower motors operate, replace switch (p 6-10). If blower motor fails to operate, go to step B.

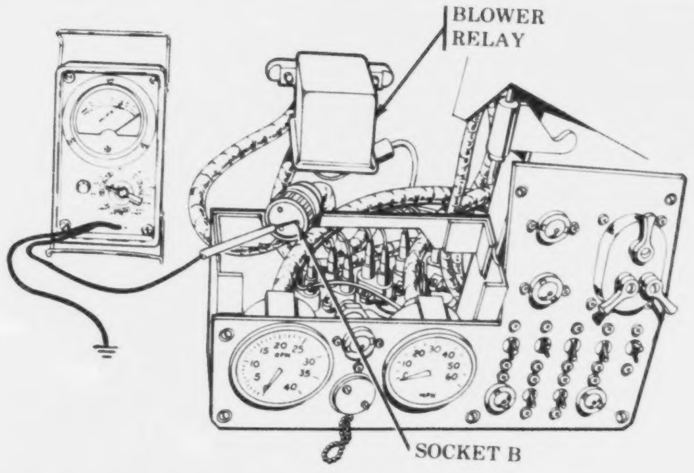

BLOWER RELAY
WIRE 415B
JUMPER WIRE

NOTE

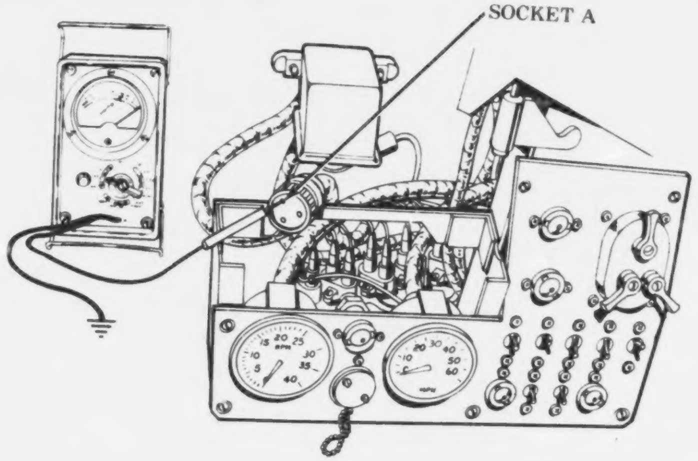
To trace circuit 415B check harnesses 12268102 (p 6-64), 12268100 (p 6-68), 12260287 (p 6-84) and 10897991 (p 6-92).

B Disconnect wire 415B at air cleaner blower relay. Using jumper, ground wire 415B (lead from blower relay). If blower motors operate, replace wire 415B from air cleaner blower relay to air cleaner blower pressure switch. If motor fails to operate, go to step C.

TA310473

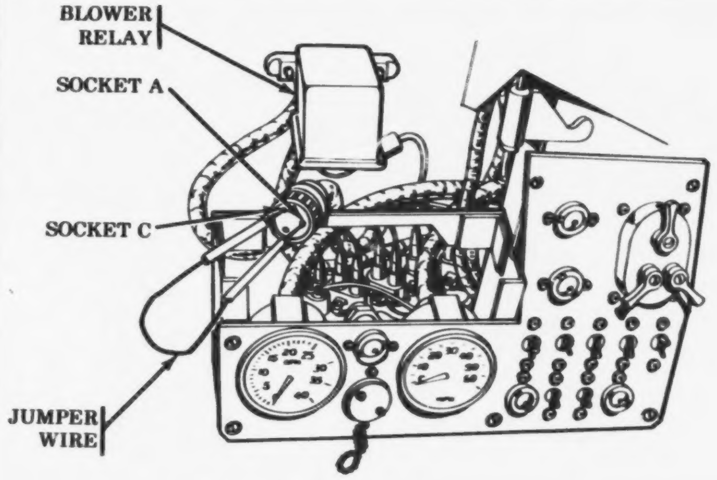


C Disconnect air cleaner blower relay connector. Place red multimeter lead in socket B and ground black lead. If no voltage, repair or replace wire 415A (p 6-92). If voltage is present, go to step D.

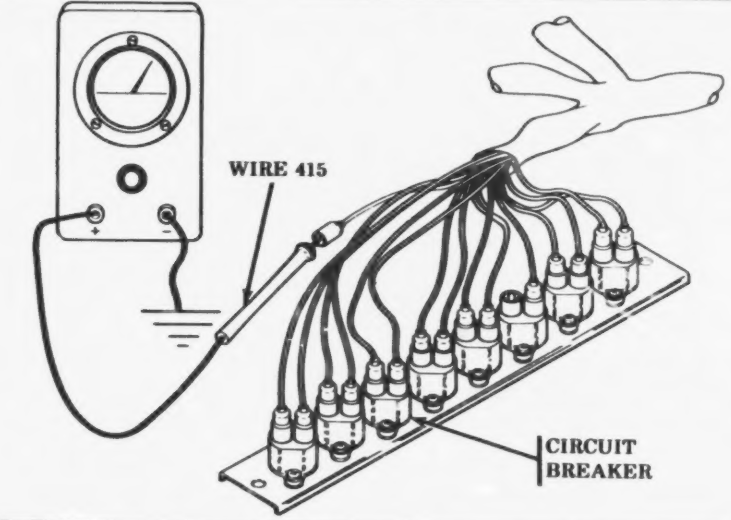


D Place red multimeter lead in socket A, ground black lead, and check for voltage. If no voltage, repair wire 415 (p 6-92). If voltage is present, go to step E.

TA310474

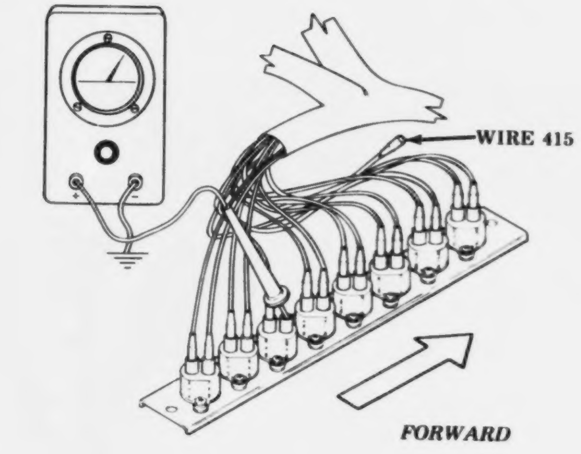

BLOWER RELAY
SOCKET A
SOCKET C
JUMPER WIRE

E Use jumper to connect socket A to socket C. If blower motors operate, replace air cleaner blower relay (p 6-51). If blower motors fail to operate, leave jumper wire connected and go to step F.

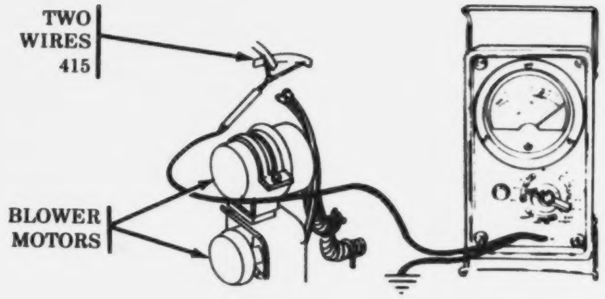

WIRE 415
+
−
CIRCUIT BREAKER

F Disconnect wire 415 at circuit breaker. Place red multimeter lead in wire 415, ground lead and check for voltage. If voltage is not present, repair or replace wire 415 (Appx F). If voltage is present, leave jumper wire connected and go to step G.

TA310475

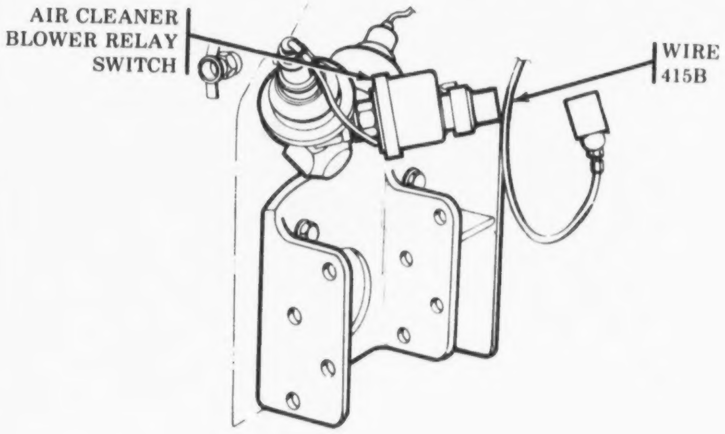


G Disconnect wire 415 at circuit breaker. Place red multimeter lead in circuit breaker output, ground black lead and check for voltage. If no voltage, replace circuit breaker (p 6-54). If voltage is present, leave jumper wire connected and go to step H.

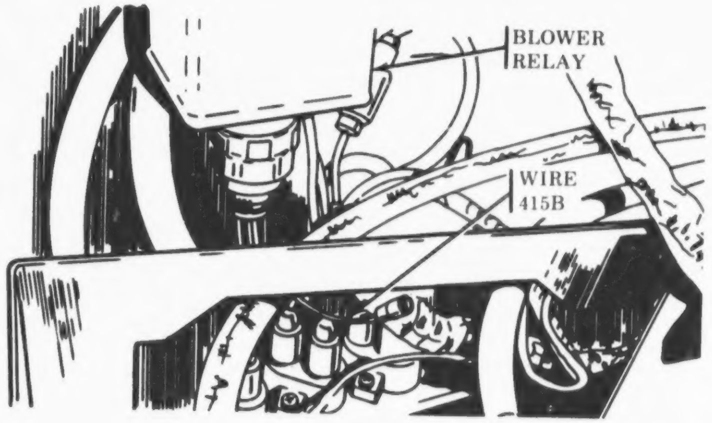


H Reconnect all connectors and wires. Disconnect wire 415 from each blower motor and start engine. Wait for engine oil pressure to build above 12 psi. Check both wires 415 for voltage, using multimeter with red lead in wire and black lead ground. If no voltage, repair or replace wires 415 (p 6-92). If voltage is present, replace blower motors (p 6-52).

TA310476



I Remove engine compartment access cover (p 3-14). Turn MASTER switch ON. Disconnect wire 415B from air cleaner blower pressure switch. If blower motors stop, replace relay switch (p 6-10). If blower motors continue to operate, reconnect wire and go to step J.

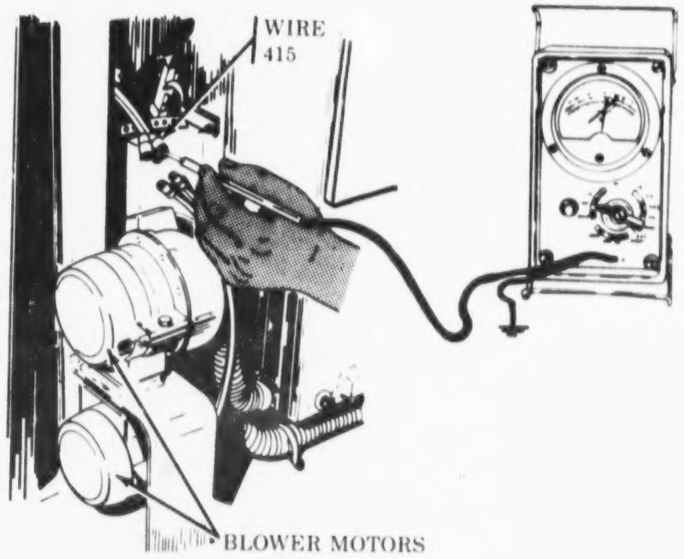


NOTE

To trace circuit 415B check harnesses 12268102 (p 6-64), 12268100 (p 6-68), 12260287 (p 6-84) and 10897991 (p 6-92).

J Turn MASTER switch ON and disconnect wire 415B from air cleaner blower relay. If blower motors stop, repair or replace wire 415B from blower relay to blower pressure switch. If blower motors continue to operate, replace blower relay (p 6-51).

TA310477



K Start engine and wait for engine oil pressure to build above 12 psi. Disconnect wire 415 at disabled blower motor and check for voltage. If no voltage, repair or replace wire 415 (p 6-92). If voltage is present, replace blower motor (p 6-51).

TA312696

GENERATOR (ALTERNATOR)	**CHARGING SYSTEM DOESN'T OPERATE** **Gage shows no charge with engine running or isn't steady or accurate.** **BATTERY IS OVERCHARGING** **Battery gage is in right red.**

START HERE

1 Start engine and check air cleaner dust exhauster motors for operation. If inoperative, troubleshoot and repair air cleaner blower motor circuit (p 2-113). If air cleaner dust exhauster motors operate, go to step 2.

2 Run STE/ICE Test No. 83 (p 2-48.40).

- a If test passes, go to step 3.
- b If test fails, go to step 5.

3 Run STE/ICE Test No. 82 (p 2-48.38).

- a If test passes, go to step 4.
- b If test fails, replace voltage regulator (p 6-5) and verify no faults.

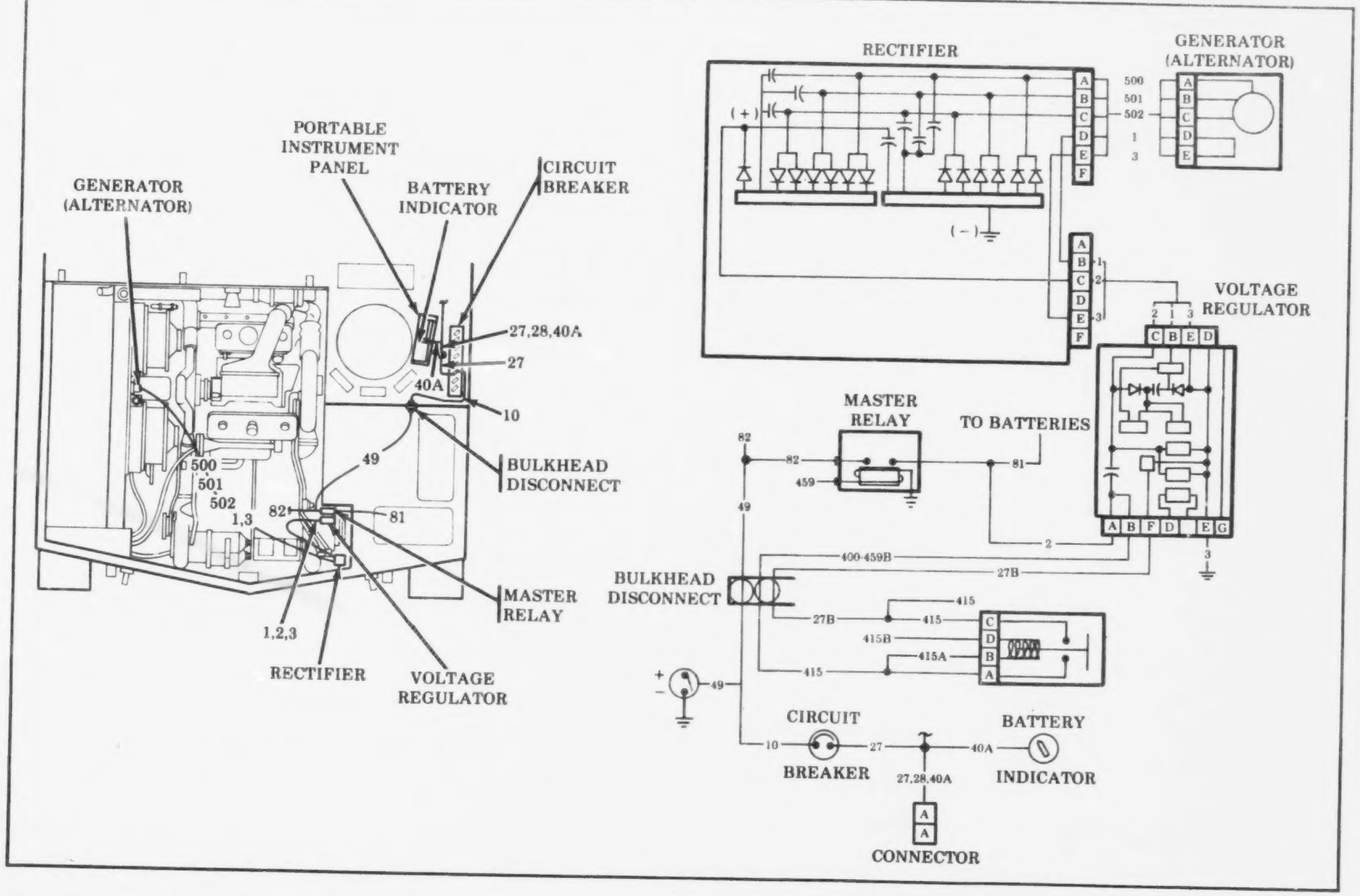
4 Run STE/ICE Test No. 67 (engine running) (p 2-48.29).

- a If reading is greater than 28.5 volts, go to step 5I.
- b If reading is less than 27.5 volts, go to step 5G.
- c If test passes, go to step 5A.

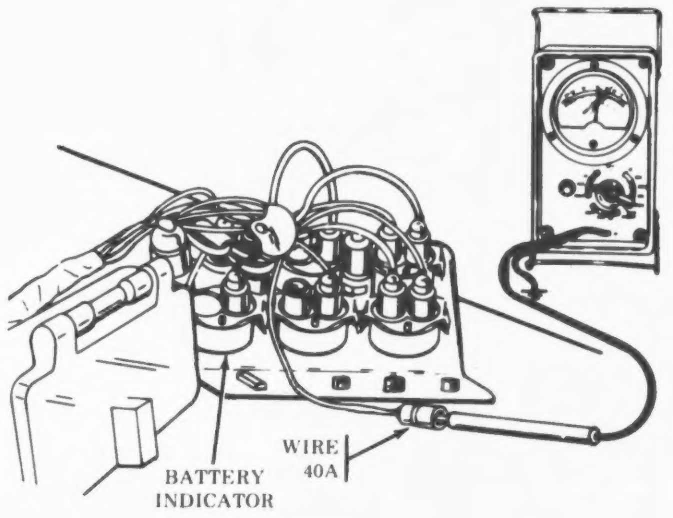
5 Troubleshoot charging system circuit.

TA312697

CHARGING SYSTEM CIRCUIT

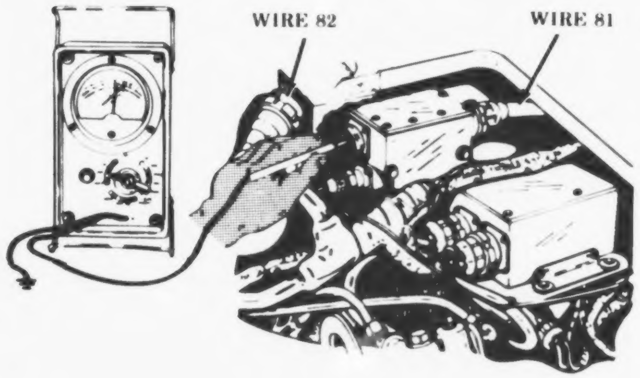

GENERATOR (ALTERNATOR)
PORTABLE INSTRUMENT PANEL
BATTERY INDICATOR
CIRCUIT BREAKER
27,28,40A
27
40A
10
BULKHEAD DISCONNECT
49
500
501
502
1,3
82
81
MASTER RELAY
1,2,3
RECTIFIER
VOLTAGE REGULATOR
RECTIFIER
(+)
(−)
A
B
C
D
E
F
500
501
502
1
3
GENERATOR (ALTERNATOR)
VOLTAGE REGULATOR
C B E D
A B F D E G
MASTER RELAY
TO BATTERIES
82
459
81
49
2
400-459B
27B
BULKHEAD DISCONNECT
415
415B
415A
C
D
B
A
CIRCUIT BREAKER
BATTERY INDICATOR
10
27
40A
27,28,40A
CONNECTOR

TA310479

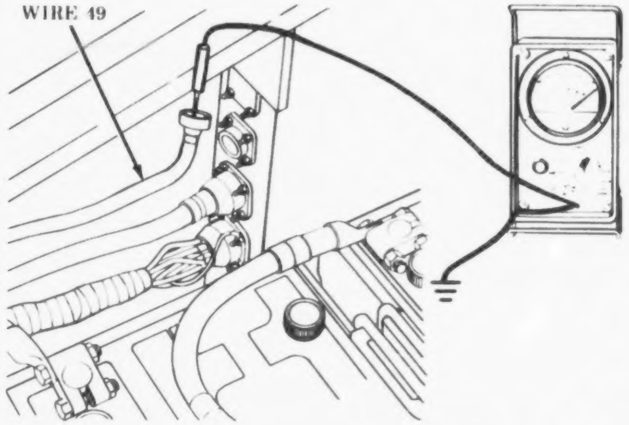


A Disassemble portable instrument panel (p 6-21). Disconnect wire 40A from BATTERY indicator and check for voltage by placing red lead of multimeter in wire 40A and black lead to ground. If voltage is present, replace indicator (p 6-19). If voltage is not present, go to step B.

TA312698

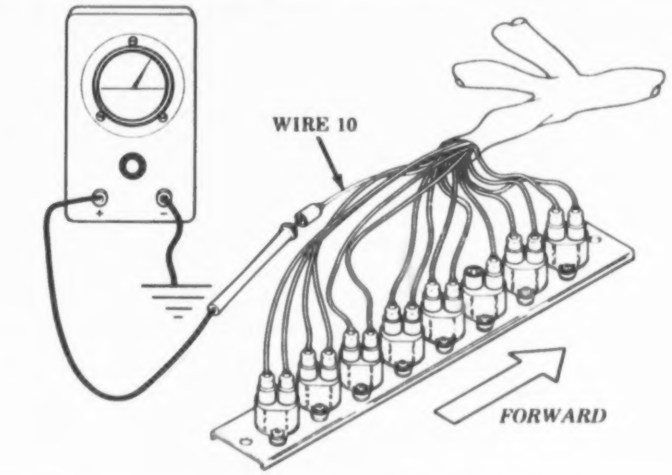


B Check wire 81 for breaks, cuts and corroded terminals. Replace if necessary (p 6-68). Disconnect wire 82 from master relay. Place red multimeter lead in master relay and ground black lead. Check voltage. If no voltage, replace master relay (p 6-45). If voltage is present, reconnect and go to step C.

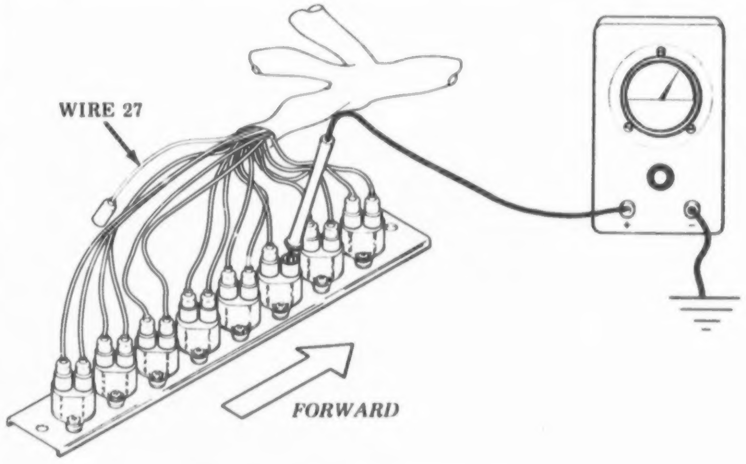


C Disconnect wire 49 at bulkhead disconnect. Place red multimeter lead in wire 49 and black lead to ground. Check for voltage. If voltage is not present, replace wire 49 from master relay to bulkhead (Appx F). If voltage is present, reconnect and go to step D.

TA312699

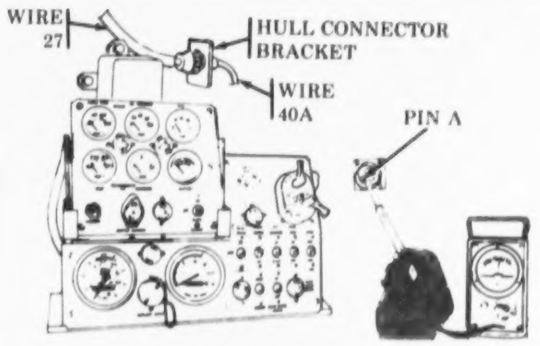


D Disconnect wire 10 to cage and panel lights circuit breaker. Place red multimeter lead in wire 10 and black lead to ground. Check for voltage. If voltage is not present, replace wire 10 (p 6-77). If voltage is present, reconnect and go to step E.



E Disconnect wire 27 at circuit breaker. Place red lead of multimeter in circuit breaker output. Check for voltage. If voltage is not present, replace circuit breaker (p 6-54). If voltage is present, go to step F.

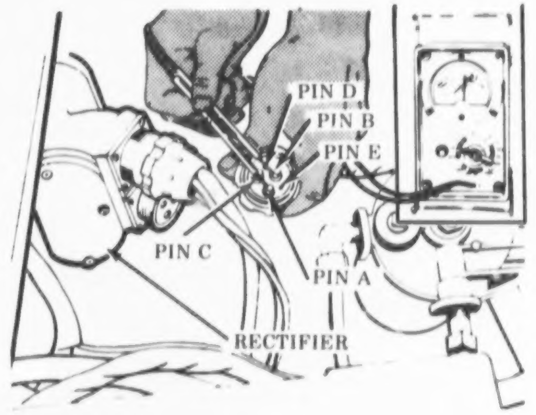
TA312700



F Disconnect harness at hull connector bracket on bulkhead next to driver's instrument panel. Place red lead of multimeter on pin A black lead to ground. Check for voltage. If voltage is present, repair or replace wire 40A (p 6-89). If voltage is not present, repair or replace wire 27 (p 6-84).

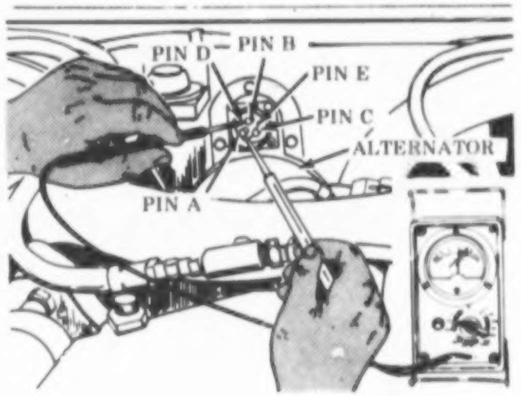
NOTE

For steps G, H, I and J, use jumper wires with alligator clips.

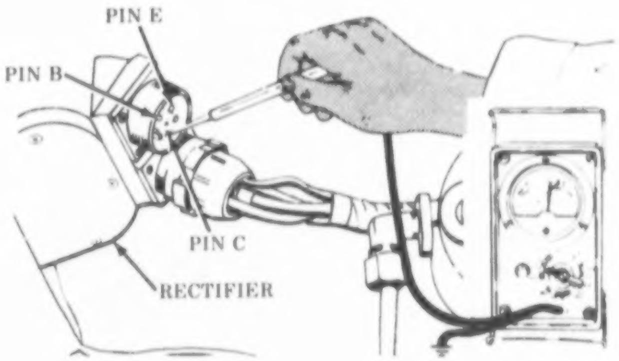


G Disconnect the generator (alternator)-to-rectifier harness at the rectifier. With jumper wires, connect pin E of the harness connector to a battery negative terminal and pin D of the connector to the positive terminal of the same battery to apply 12 volts dc to the alternator field. With the engine running at idle speed and the multimeter set on the ac volts scale, place red lead on pin A and black lead on pin B and note voltage reading. Place red lead on pin B and black lead on pin C and note reading. Then place red lead on pin C and black lead on pin A and note reading. All readings should be between 30 and 34 voltages. If these voltages are present, reconnect harness and go to step I. If these voltages are not present or vary considerably, go to step H.

TA312701

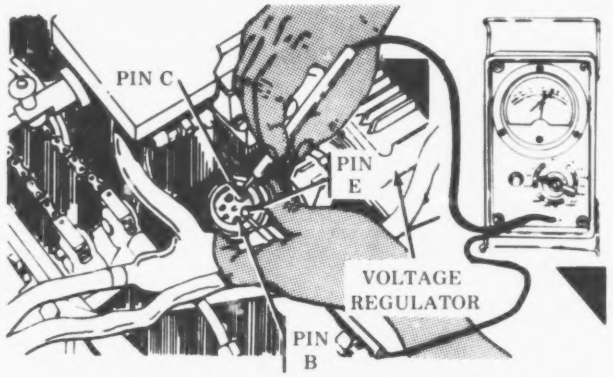


H Disconnect harness at alternator. With jumper wires, connect pin E of alternator to a battery negative terminal and pin D of alternator to the same battery positive terminal to apply 12 volts dc to the alternator field. Run vehicle engine at idle speed, set multimeter on ac volts scale, place red lead on pin A and negative lead on pin B, and note voltage reading. Then place red lead on pin C and black lead on pin A and note voltage reading. All readings should be between 30 and 34 volts. If these voltages are present, repair or replace cable from alternator to rectifier (p 6-64). If these voltages are not present or vary considerably, replace generator (alternator) (p 6-4).

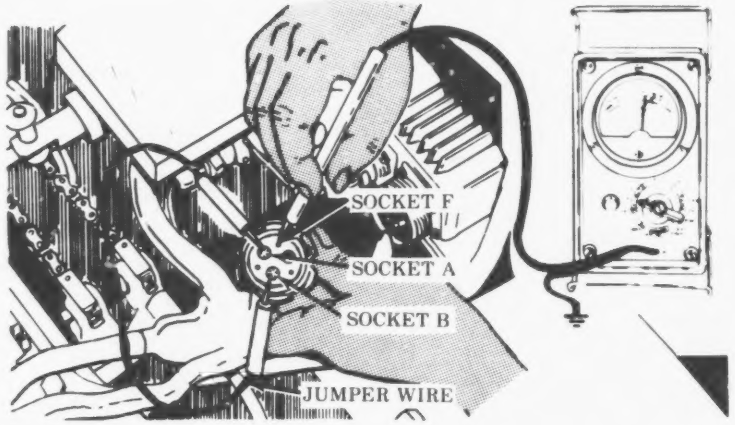


I Disconnect rectifier-to-regulator harness at rectifier. With jumper wires, connect pin E of rectifier to a battery negative terminal and pin B of harness to same battery positive terminal. With vehicle engine running at idle speed and multimeter set on dc volts scale, place red lead on rectifier pin C and black lead to ground. Multimeter reading should be between 30 and 34 volts. If this voltage is not present, replace rectifier (p 6-7). If this voltage is present, reconnect harness and go to step J.

TA312702



J Disconnect rectifier-to-regulator harness at voltage regulator. With jumper wires, connect pin E of harness to a battery negative terminal and pin B of harness to positive terminal of the same battery. With vehicle engine running at idle speed and multimeter set on the dc volts scale, place red lead on pin C of harness and black lead to ground. Multimeter reading should be between 30 to 34 volts. If this voltage is not present, repair or replace rectifier-to-regulator harness (p 6-76). If this voltage is present, go to step K.

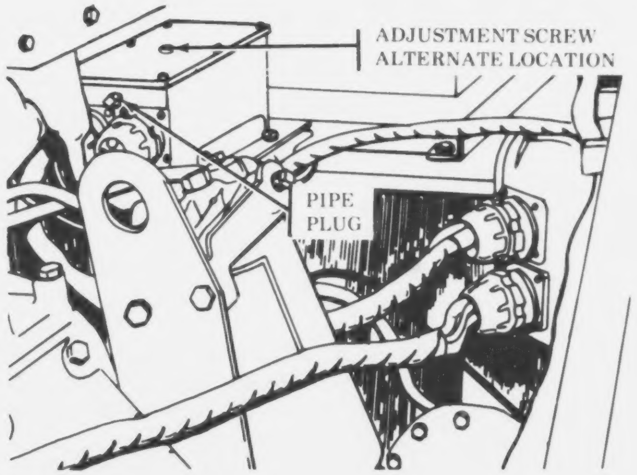


K MASTER switch OFF. Disconnect voltage regulator to bulkhead harness at voltage regulator. Use a jumper wire to connect socket A to socket B. Place MASTER switch to ON position and start engine. Run engine at 1000 rpm (oil pressure 12 psi). Place red lead of multimeter in socket F and black lead to ground. If voltage is 24 vdc, troubleshoot air cleaner blower motor circuit (p 2-113).

TA312703

NOTE

Batteries can be totally discharged within four to six hours if air cleaner blower motor system is malfunctioning or if blower motors operate full time. Troubleshooting step K provides a basic test of the blower motor circuit by testing the blower motor relay output voltage to the voltage regulator (wire 27B). If the blower motor relay output is 24 vdc (battery power) with the voltage regulator disconnected from the circuit, then the voltage regulator is malfunctioning/inoperative and will not charge the battery. If the voltage is less than 24 vdc (battery power), then the blower motor circuit is malfunctioning and discharging the battery.



CAUTION

Extremely low battery electrolyte levels will cause a low voltage indication on the BATTERY indicator on portable instrument panel. Regulators can be damaged by attempts to adjust the rheostat beyond its stops when the only problem is dry batteries.

L Do not check or adjust voltage regulator except as follows:

Make sure batteries are fully charged (TM 9-2350-267-10).

TA312704

Connect red multimeter lead to the positive battery cable terminal and black lead to negative battery cable terminal.

Start engine and run at approximately 1000 rpm. Run engine as required to bring engine compartment, regulator and batteries to normal operating temperature.

During above warm-up period, increase engine speed to approximately 2500 rpm and then return to idle speed while observing multimeter. Voltage reading should not vary more than +0.1 volt during above check. This also provides a check on tightness of wiring connection. Turn headlights on and off several times. Multimeter needle may vary slightly, but should return to its original (voltage) quickly.

Turn off all major vehicle electrical components and turn on vehicle headlights.

Open transmission left access door and remove square head pipe plug from end of voltage regulator (between and above harness connectors).

CAUTION

Rheostat turns easily. Do not force beyond the stops.

With engine running at 1000 rpm, use a screwdriver to adjust rheostat to obtain a voltage reading of 27.5 to 28.5 volts. Turn screwdriver counterclockwise to reduce voltage. Slowly turn screwdriver clockwise to bring regulated voltage up to 27.5 to 28.5 volts.

Replace plug in end of regulator (screw on top of regulator).

Shut off engine and remove multimeter.

If regulator cannot be adjusted, replace regulator (p 6-5).

If electrical (battery) problems continue after the regulator has been properly checked and/or adjusted, check the service, maintenance and/or usage of the battery (TM 9-6140-200-14).

TA310487

GAGES	**ENGINE COOLANT TEMPERATURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE** Do steps A through C. **ENGINE LOW LEVEL COOLANT LIGHT DOESN'T LIGHT OR GIVES FALSE INDICATION OF COOLANT LOW LEVEL CONDITIONS** Do steps D through G.

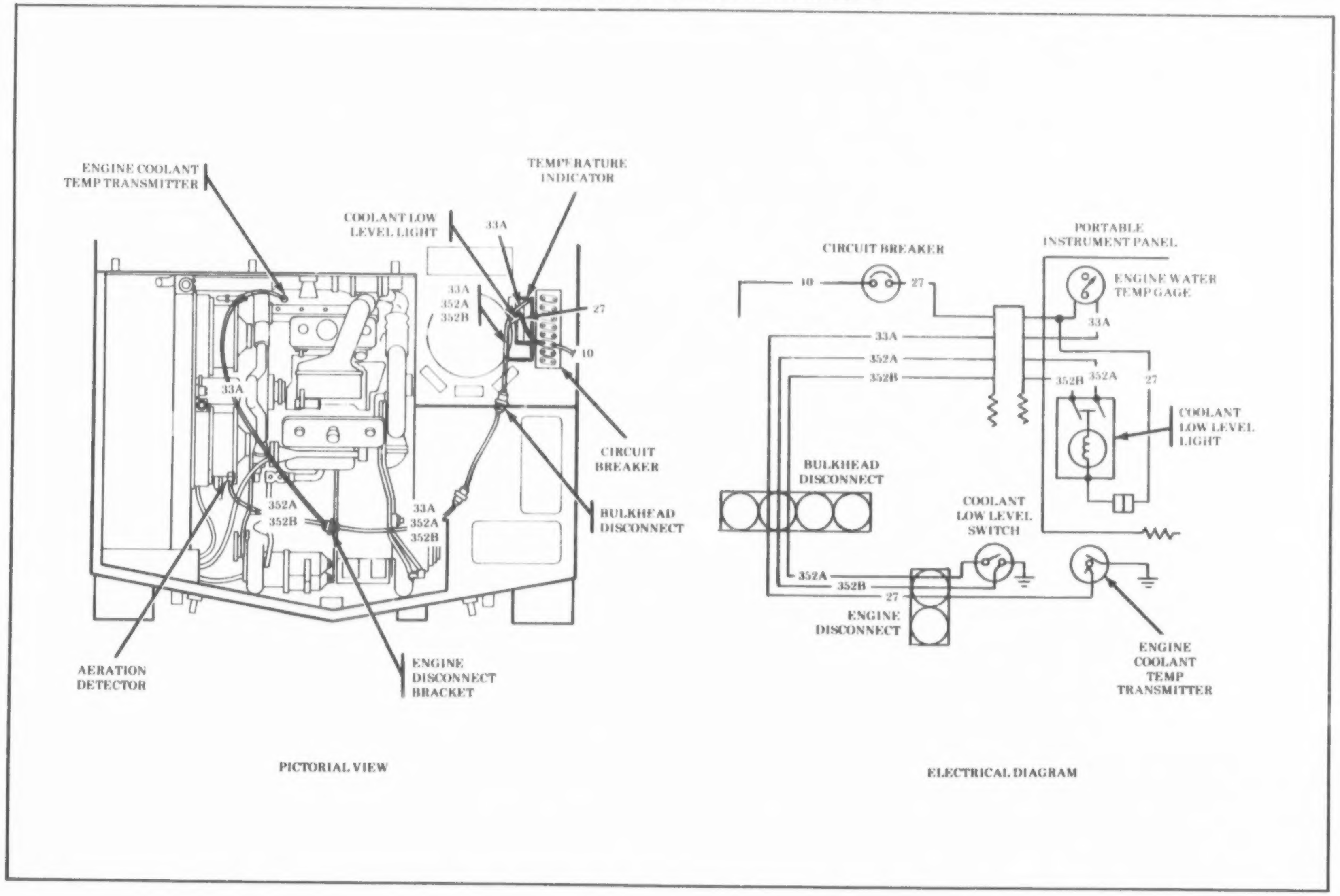
START HERE →

1 Troubleshoot engine coolant temperature (ENGINE WATER TEMP) indicator circuit.

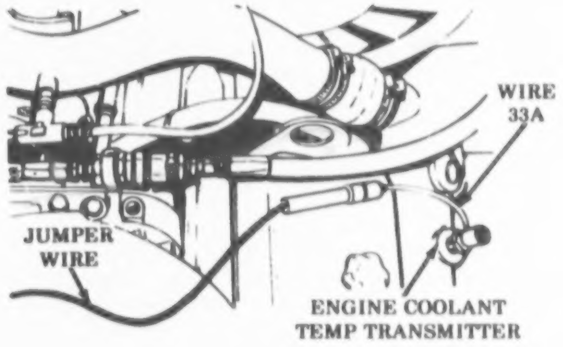
2 Troubleshoot engine low level coolant (AERATION DETECTOR) circuit.

TA310488

ENGINE COOLANT INDICATOR CIRCUITS


ENGINE COOLANT TEMP TRANSMITTER
TEMPERATURE INDICATOR
COOLANT LOW LEVEL LIGHT
33A
33A
352A
352B
27
10
33A
CIRCUIT BREAKER
352A
352B
33A
352A
352B
BULKHEAD DISCONNECT
AERATION DETECTOR
ENGINE DISCONNECT BRACKET
PICTORIAL VIEW
CIRCUIT BREAKER
10
27
PORTABLE INSTRUMENT PANEL
ENGINE WATER TEMP GAGE
33A
33A
352A
352B
352B
352A
27
COOLANT LOW LEVEL LIGHT
BULKHEAD DISCONNECT
COOLANT LOW LEVEL SWITCH
352A
352B
27
ENGINE DISCONNECT
ENGINE COOLANT TEMP TRANSMITTER
ELECTRICAL DIAGRAM

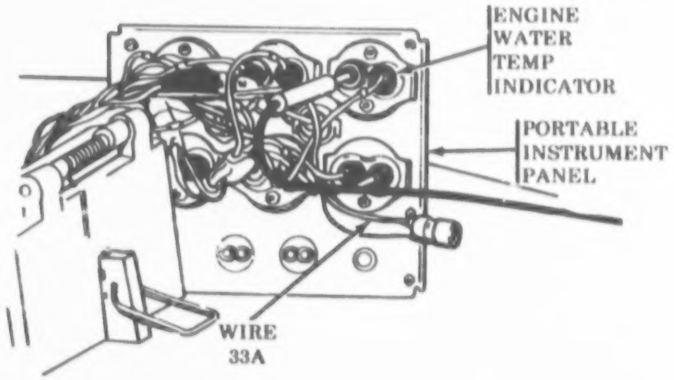
TA310489


WIRE
33A
JUMPER
WIRE
ENGINE COOLANT
TEMP TRANSMITTER

NOTE

Battery cables connected and MASTER switch ON.

A Disconnect wire 33A from engine coolant temperature transmitter. After disconnecting, if ENGINE WATER TEMP indicator shows a minimum reading, use a jumper wire to ground wire 33A. After grounding, if indicator shows a maximum reading, replace engine coolant temperature transmitter (p 6-8). If indicator fails to show a minimum or maximum reading, go to step B.

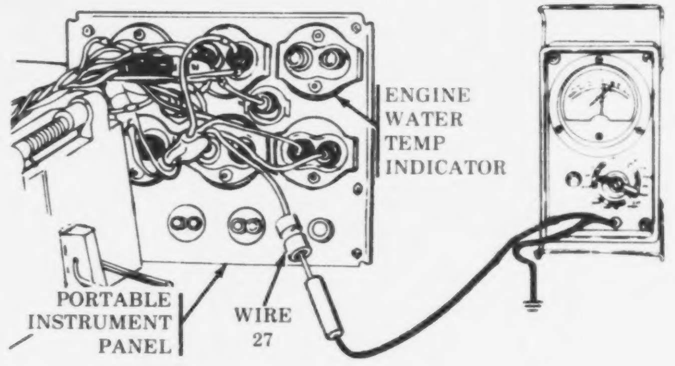

ENGINE
WATER
TEMP
INDICATOR
PORTABLE
INSTRUMENT
PANEL
WIRE
33A

NOTE

To trace circuit 33A, check harnesses 12268102 (p 6-64), 12208100 (p 6-68), 12260287 (p 6-84) and 12260298 (p 6-89).

B Disconnect wire 33A at ENGINE WATER TEMP indicator (p 6-21 and 6-24). If indicator shows a minimum reading, use a jumper wire to ground indicator. If indicator shows a maximum reading, repair or replace circuit 33A from indicator to transmitter. If indicator fails to read correctly, go to step C.

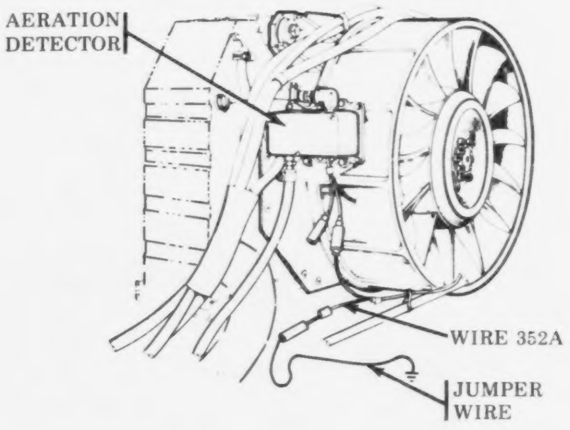
TA310490


ENGINE
WATER
TEMP
INDICATOR
PORTABLE
INSTRUMENT
PANEL
WIRE
27

NOTE

To trace circuit 27, check wiring harnesses 12260298 (p 6-89) and 12260287 (p 6-84).

C Disconnect wire 27 from ENGINE WATER TEMP indicator (p 6-21 and 6-24). Place red lead of multimeter in wire 27. Ground black lead and check for voltage. If voltage is present, replace ENGINE WATER TEMP indicator (p 6-21). If no voltage, repair or replace circuit 27. Reconnect all wires.


AERATION
DETECTOR
WIRE 352A
JUMPER
WIRE

D Disconnect wire 352A at aeration detector. Use a jumper wire to connect 352A to ground. If indicator lamp lights, replace aeration detector (p 6-18). If indicator lamp does not light, go to step E.

TA310491

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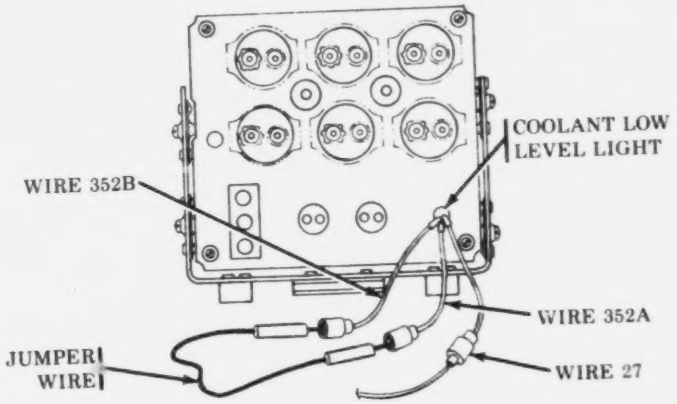
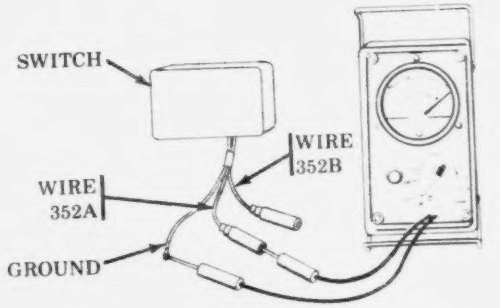
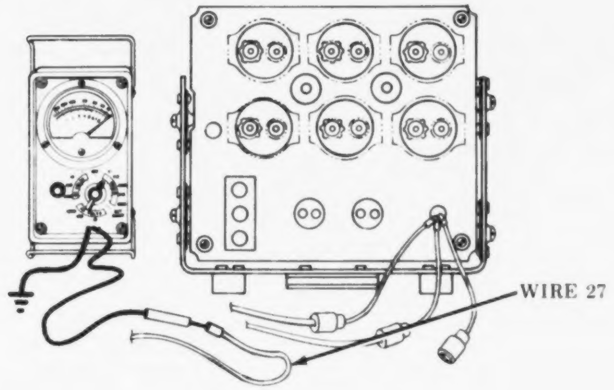

COOLANT LOW
LEVEL LIGHT
WIRE 352B
WIRE 352A
JUMPER
WIRE
WIRE 27

E Disconnect wires 352A and 352B at coolant low level light terminals at portable instrument panel (p 6-21). Use jumper wire to connect wire 352A and 352B connectors on indicator light. If indicator lamp lights up, go to step F. If indicator lamp does not light up, go to step G.


SWITCH
WIRE
352B
WIRE
352A
GROUND

F Disconnect wires 352A and 352B at aeration detector. Remove aeration detector cover. Place red lead of multimeter in wire 352A and black lead to ground. If multimeter reading is , depress switch. Multimeter should read above 0 ohms but below . Repeat for wire 352B. If multimeter reading does not move from toward the 0-ohm level when the switch is depressed, replace the aeration detector (p 6-18).

TA310492



NOTE

To trace circuit 36, check wiring harnesses 12268102 (p 6-64), 12268100 (p 6-68), 12260287 (p 6-84) and 12260298 (p 6-88).

G Disconnect wire 27 from coolant low level light terminal (p 6-21). Place red lead of multimeter in wire 27 and black lead to ground. If voltage is present, replace coolant low level light assembly (p 6-21). If voltage is not present, repair or replace wire 27.

TA310493

GAGES	ENGINE OIL PRESSURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE

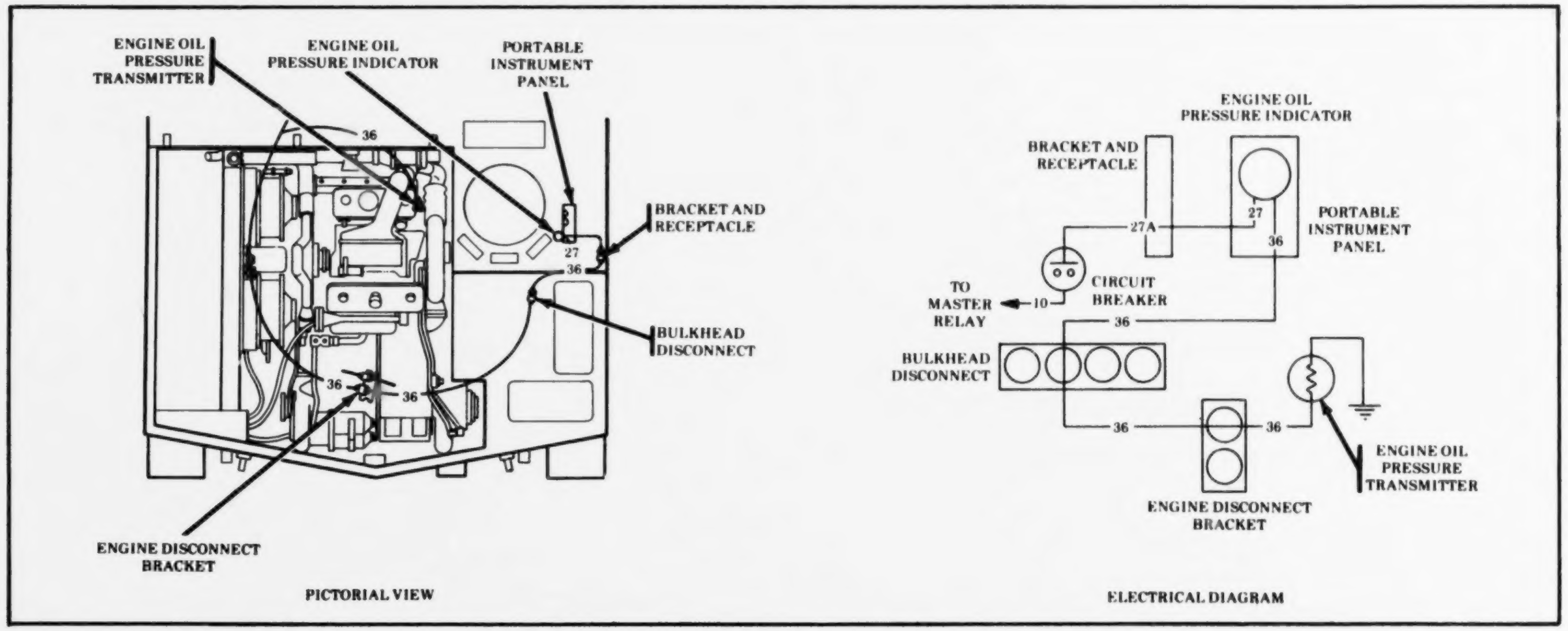
START HERE

1 Run STE/ICE Test No. 50 (idle) (p 2-48.18).

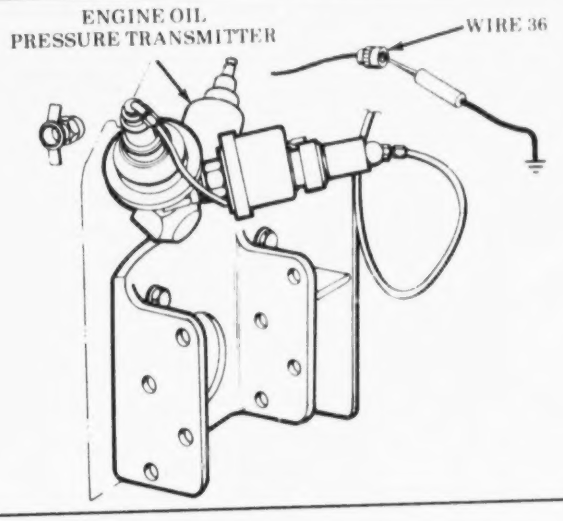
- a If test passes, go to step 2.
- b If test fails, go to engine troubleshooting. (p 2-82).

2 Troubleshoot ENGINE OIL PRESSURE indicator circuit.

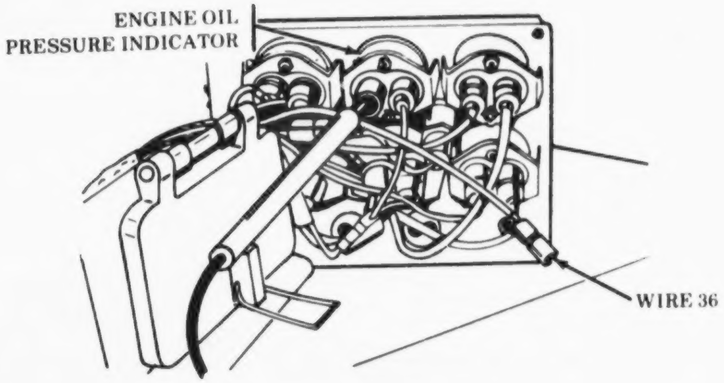
ENGINE OIL PRESSURE INDICATOR CIRCUIT


ENGINE OIL PRESSURE TRANSMITTER
ENGINE OIL PRESSURE INDICATOR
PORTABLE INSTRUMENT PANEL
36
27
36
BRACKET AND RECEPTACLE
BULKHEAD DISCONNECT
36
36
ENGINE DISCONNECT BRACKET
PICTORIAL VIEW
ENGINE OIL PRESSURE INDICATOR
BRACKET AND RECEPTACLE
27A
27
36
PORTABLE INSTRUMENT PANEL
TO MASTER RELAY
10
CIRCUIT BREAKER
36
BULKHEAD DISCONNECT
36
36
ENGINE OIL PRESSURE TRANSMITTER
ENGINE DISCONNECT BRACKET
ELECTRICAL DIAGRAM

TA312705


ENGINE OIL
PRESSURE TRANSMITTER
WIRE 36

A Turn MASTER switch ON. Disconnect wire 36 at engine oil pressure transmitter. If ENGINE OIL PRESSURE indicator shows a maximum reading, use a jumper to ground wire 36. If indicator shows a minimum reading, replace engine oil pressure transmitter (p 6-10). If indicator fails to show a minimum or maximum reading, go to step B.

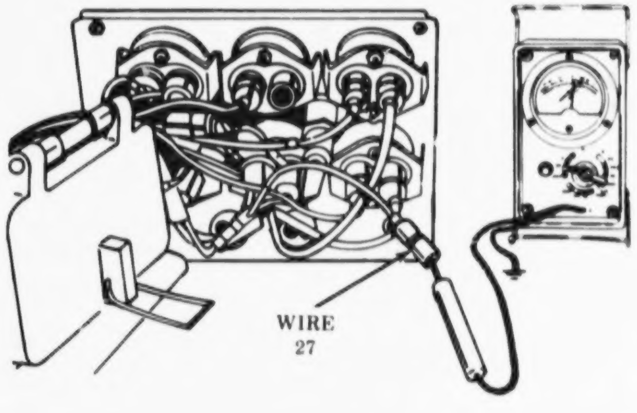

ENGINE OIL
PRESSURE INDICATOR
WIRE 36

NOTE

To trace circuit 27, check wiring harnesses 12260298 (p 6-89) and 12260287 (p 6-84).

B Disconnect wire 36 at ENGINE OIL PRESSURE indicator. If indicator shows a maximum reading, use a jumper to ground indicator. If indicator shows a minimum reading, repair or replace wire 36 from indicator to transmitter (p 6-19). If indicator fails to show a minimum or maximum reading, go to step C.

TA310495



NOTE

To trace circuit 27, check wiring harnesses 12260298 (p 6-89) and 12260287 (p 6-84).

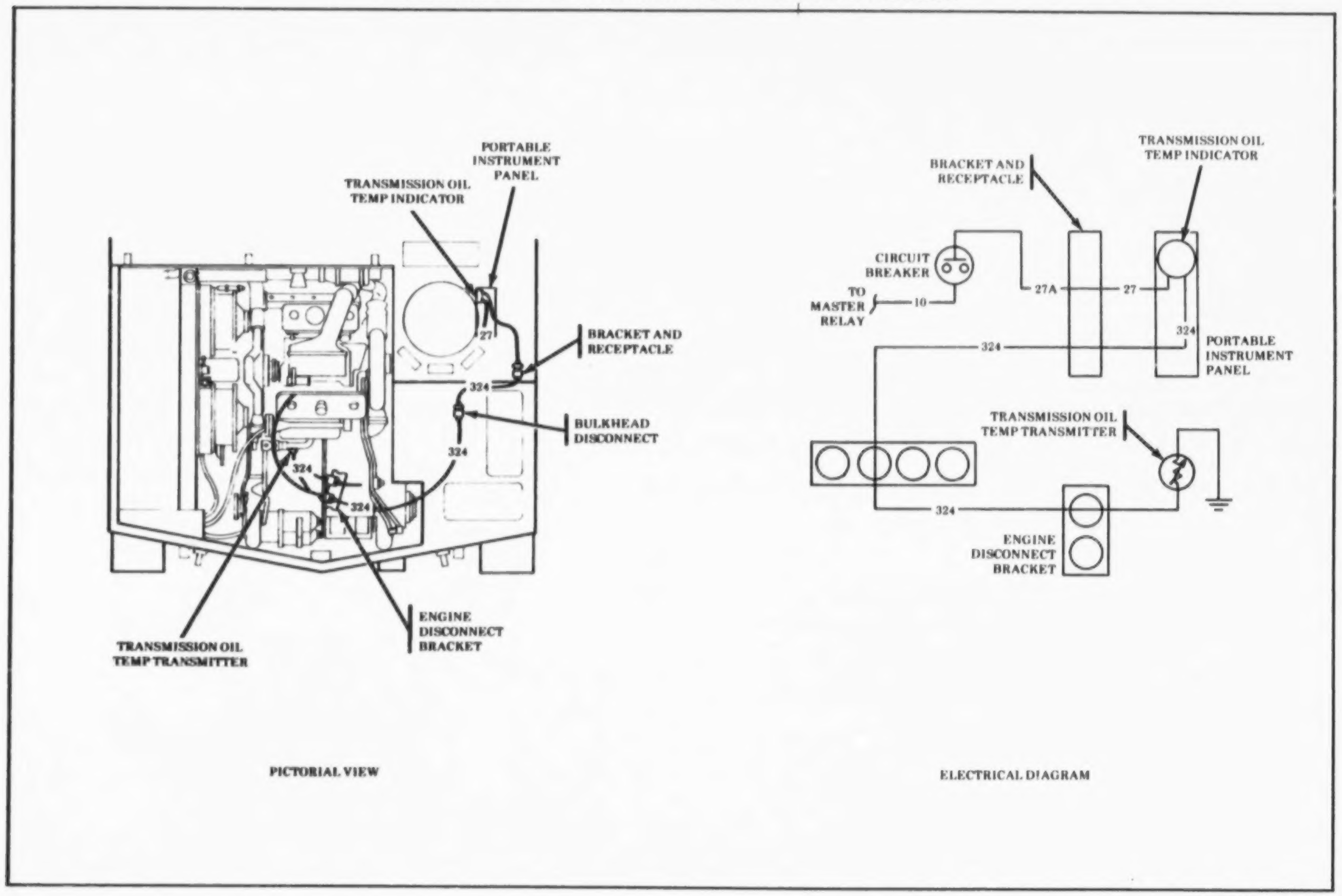
C Disconnect wire 27 from ENGINE OIL PRESSURE indicator. Place red multimeter lead in wire 27, ground black lead, and check for voltage. If voltage is present, replace ENGINE OIL PRESSURE indicator (p 6-21). If no voltage, repair or replace wire 27. Reconnect all wires.

GAGES	**TRANSMISSION OIL TEMPERATURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE**

START HERE → Troubleshoot transmission oil temperature (TRANSMISSION OIL TEMP) indicator circuit.

TA310496

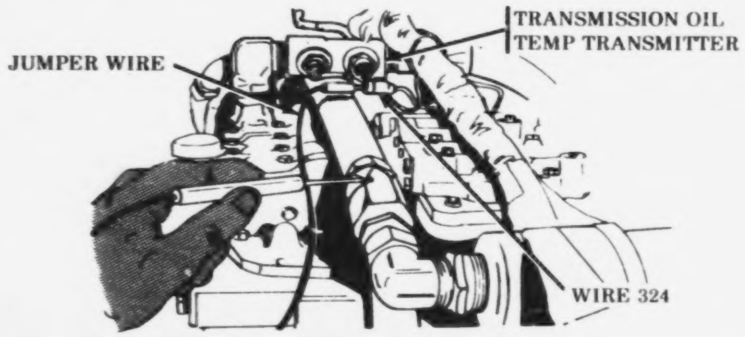
TRANSMISSION OIL TEMPERATURE INDICATOR CIRCUIT


PORTABLE INSTRUMENT PANEL
TRANSMISSION OIL TEMP INDICATOR
27
BRACKET AND RECEPTACLE
324
BULKHEAD DISCONNECT
324
324
324
TRANSMISSION OIL TEMP TRANSMITTER
ENGINE DISCONNECT BRACKET
TRANSMISSION OIL TEMP INDICATOR
BRACKET AND RECEPTACLE
CIRCUIT BREAKER
TO MASTER RELAY
10
27A
27
324
324
PORTABLE INSTRUMENT PANEL
TRANSMISSION OIL TEMP TRANSMITTER
324
ENGINE DISCONNECT BRACKET

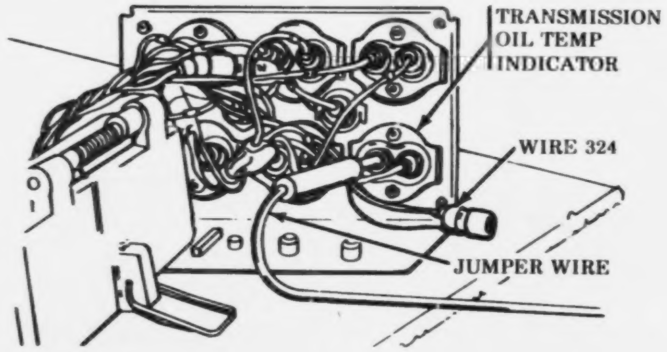
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310497


TRANSMISSION OIL TEMP TRANSMITTER
JUMPER WIRE
WIRE 324

A Turn MASTER switch ON. Disconnect wire 324 at transmission oil temperature transmitter. If TRANSMISSION OIL TEMP indicator shows a minimum reading, use a jumper wire to ground wire 324 at transmission oil temperature transmitter. If indicator shows maximum reading, replace transmission oil temperature transmitter (p 6-11). If indicator fails to show a minimum or maximum reading, go to step B.

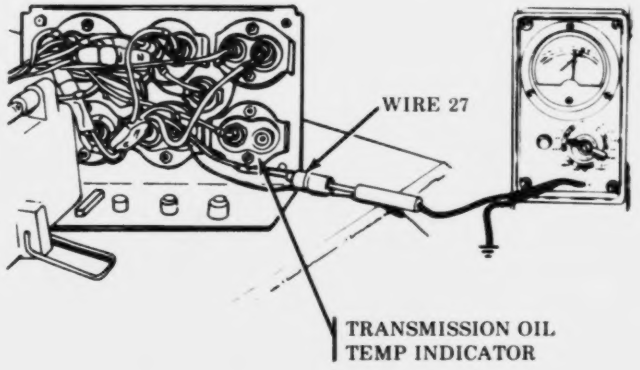

TRANSMISSION OIL TEMP INDICATOR
WIRE 324
JUMPER WIRE

NOTE

To trace circuit 324, check wiring harnesses 12268102 (p 6-64), 12268100 (p 6-68), 12260287 (p 6-84) and 12260298 (p 6-89).

B Disconnect wire 324 at TRANSMISSION OIL TEMP indicator (p 6-21). If indicator shows a minimum reading, use a jumper wire and ground indicator. If indicator shows a maximum reading, repair or replace wire 324 from indicator to transmission oil temperature transmitter. If indicator fails to show minimum or maximum reading, go to step C.

TA310498



NOTE

To trace circuit 27, check wiring harnesses 12260298 (p 6-89) and 12260287 (p 6-84).

C Disconnect wire 27 from TRANSMISSION OIL TEMP indicator. Place red lead of multimeter in wire 27, ground black lead, and check for voltage. If voltage is present, replace TRANSMISSION OIL TEMP indicator (p 6-21). If no voltage, repair or replace wire 27. Reconnect all wires.

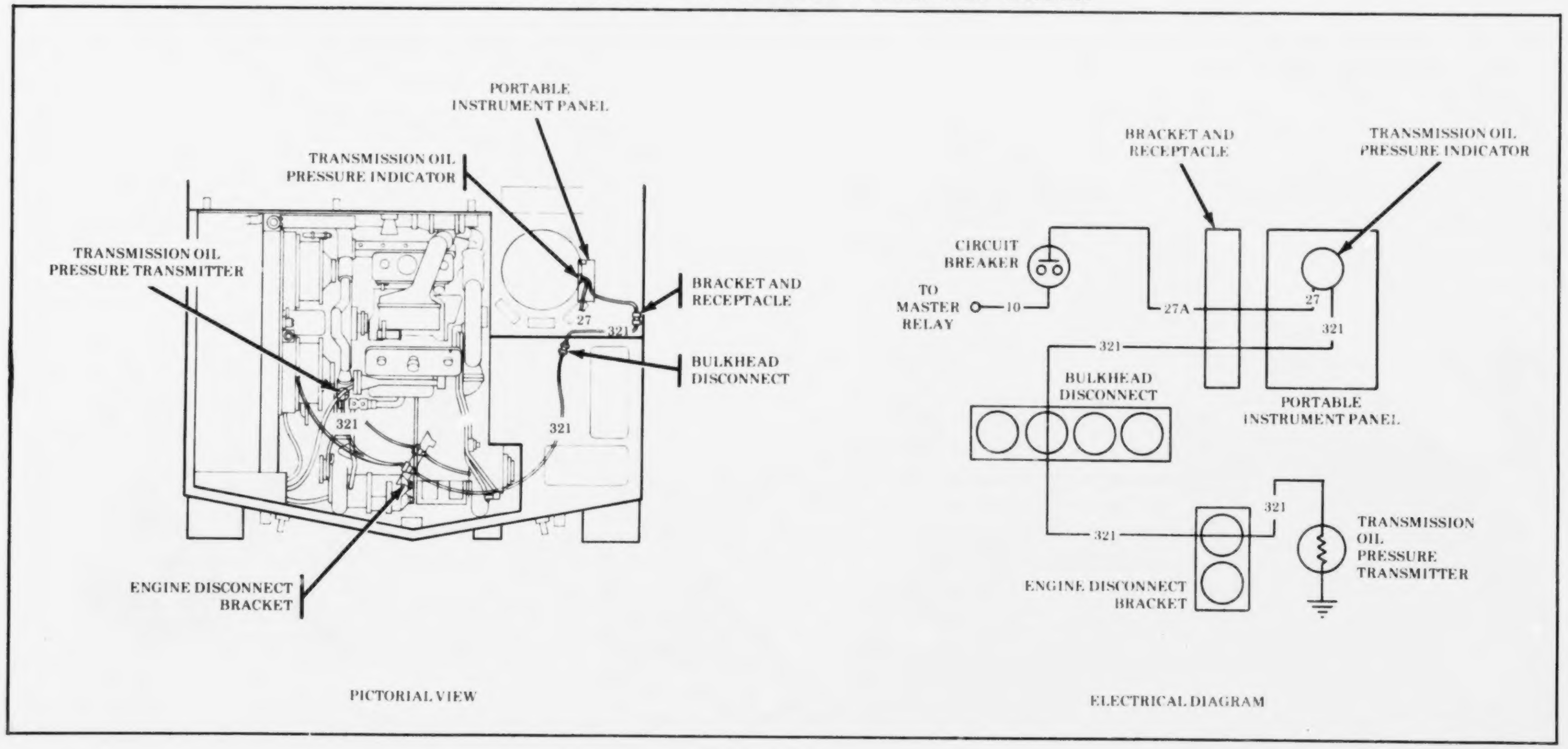
TA310499

GAGES	**TRANSMISSION OIL PRESSURE GAGE NEEDLE DOESN'T MOVE OR ISN'T STEADY OR ACCURATE**

START HERE

Troubleshoot TRANSMISSION OIL PRESSURE indicator circuit.

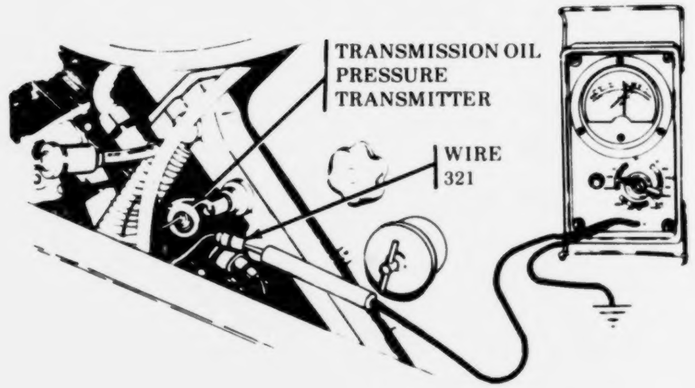
TRANSMISSION OIL PRESSURE INDICATOR CIRCUIT


PORTABLE INSTRUMENT PANEL
TRANSMISSION OIL PRESSURE INDICATOR
TRANSMISSION OIL PRESSURE TRANSMITTER
BRACKET AND RECEPTACLE
27
321
BULKHEAD DISCONNECT
321
321
ENGINE DISCONNECT BRACKET
BRACKET AND RECEPTACLE
TRANSMISSION OIL PRESSURE INDICATOR
CIRCUIT BREAKER
TO MASTER RELAY
10
27A
27
321
321
BULKHEAD DISCONNECT
PORTABLE INSTRUMENT PANEL
321
321
TRANSMISSION OIL PRESSURE TRANSMITTER
ENGINE DISCONNECT BRACKET

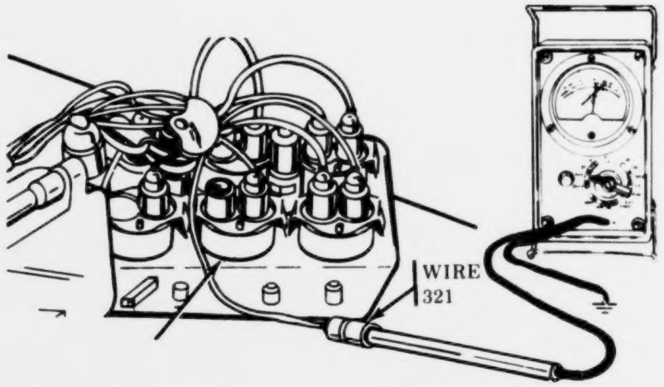
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310500



A Disconnect wire 321 from transmission oil pressure transmitter. Check for proper grounding of transmitter. If TRANSMISSION OIL PRESSURE indicator shows a maximum reading, use a jumper to ground wire 321 at transmitter. If indicator shows a minimum reading, replace transmission oil pressure transmitter (p 6-12). If indicator fails to show a minimum or maximum reading, go to step B.

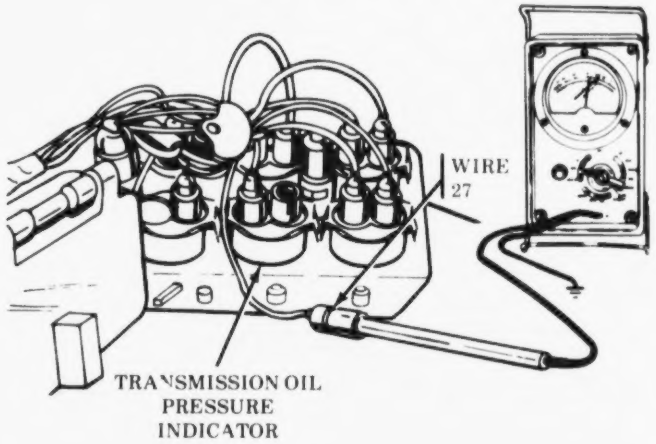


NOTE

To trace circuit 321, check wiring harnesses 12268102 (p 6-64), 12268100 (p 6-68), 12260287 (p 6-84) and 12260298 (p 6-89).

B Disconnect wire 321 from TRANSMISSION OIL PRESSURE indicator (p 6-21). If indicator shows a maximum reading, use a jumper wire to ground indicator. If indicator shows a minimum reading, repair or replace wire 321 from TRANSMISSION OIL PRESSURE indicator to transmission oil pressure transmitter. If indicator fails to show a minimum or maximum reading, go to step C.

TA310501



NOTE

To trace circuit 27, check wiring harnesses 12260298 (p 6-89) and 12260287 (p 6-84).

C Disconnect wire 27 from TRANSMISSION OIL PRESSURE indicator (p 6-21). Place red multimeter lead in wire 27 and ground black lead. Check for voltage. If voltage is present, replace TRANSMISSION OIL PRESSURE indicator (p 6-21). If no voltage, repair or replace wire 27. Reconnect all wires.

GAGES	**FUEL LEVEL GAGE NEEDLE DOESN'T MOVE** **Do steps A through C.** **FUEL LEVEL GAGE SHOWS LEVEL FOR LOWER TANK BUT NOT FOR UPPER TANK.** **Do steps D and E.** **FUEL LEVEL GAGE SHOWS LEVEL FOR UPPER TANK BUT NOT FOR LOWER TANK.** **Do steps F and G.**

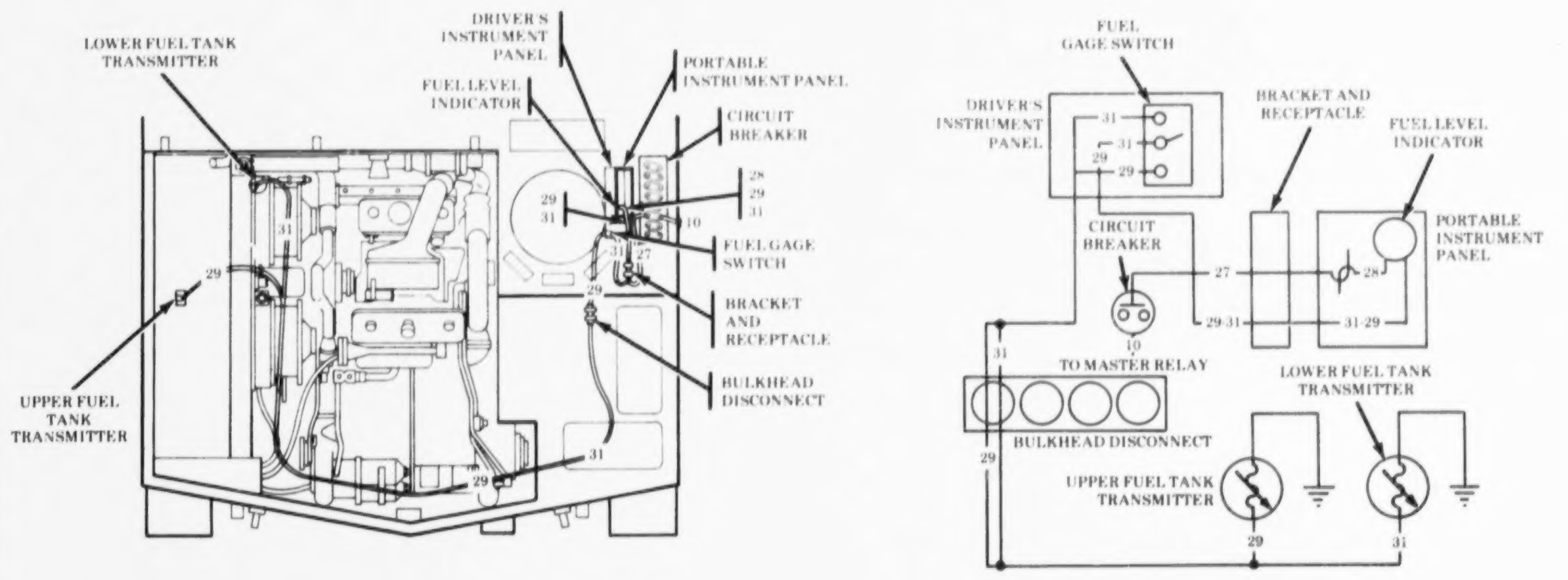
START HERE

1 Fill fuel tanks (TM 9-2350-267-10).

2 Troubleshoot FUEL LEVEL indicator circuit.

TA310502

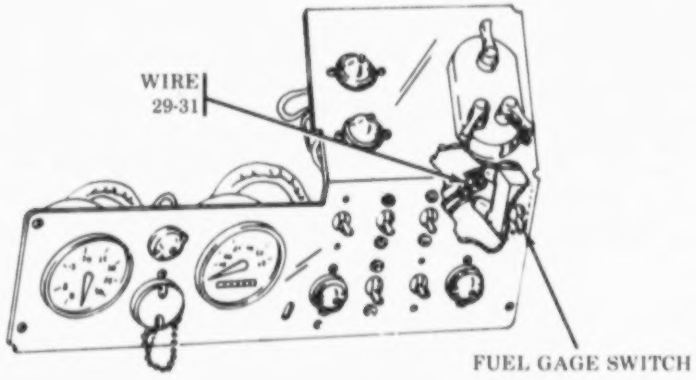
FUEL LEVEL INDICATOR CIRCUIT


LOWER FUEL TANK TRANSMITTER
DRIVER'S INSTRUMENT PANEL
FUEL LEVEL INDICATOR
PORTABLE INSTRUMENT PANEL
CIRCUIT BREAKER
28
29
31
29
31
10
31
27
FUEL GAGE SWITCH
29
BRACKET AND RECEPTACLE
BULKHEAD DISCONNECT
31
29
29
UPPER FUEL TANK TRANSMITTER
31
FUEL GAGE SWITCH
DRIVER'S INSTRUMENT PANEL
31
31
29
29
BRACKET AND RECEPTACLE
FUEL LEVEL INDICATOR
PORTABLE INSTRUMENT PANEL
CIRCUIT BREAKER
27
28
29-31
31-29
10
TO MASTER RELAY
31
BULKHEAD DISCONNECT
29
LOWER FUEL TANK TRANSMITTER
UPPER FUEL TANK TRANSMITTER
29
31

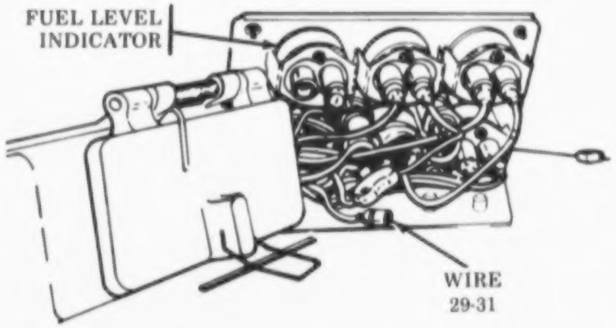
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310503



A Disconnect wire 29-31 from FUEL GAGE switch (p 6-19). Turn MASTER switch ON. If FUEL LEVEL indicator shows maximum reading, ground wire 29-31, using jumper wire. If indicator shows a minimum reading, go to step D. If indicator fails to show minimum or maximum reading, go to step B.

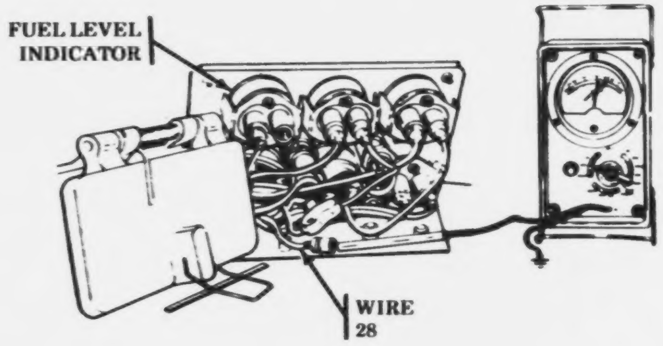


NOTE

To trace circuit 29-31, check wiring harnesses 12260287 (p 6-84) and 12260298 (p 6-89).

B Disconnect wire 29-31 from FUEL LEVEL indicator (6-21). Turn MASTER switch ON. If indicator shows a maximum reading, ground indicator. If indicator shows a minimum reading, repair or replace wire 29-31. If indicator fails to show a minimum or maximum reading, go to step C.

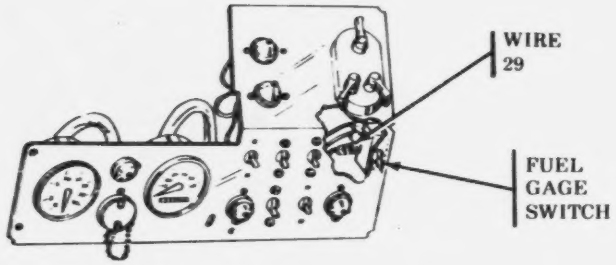
TA310504



NOTE

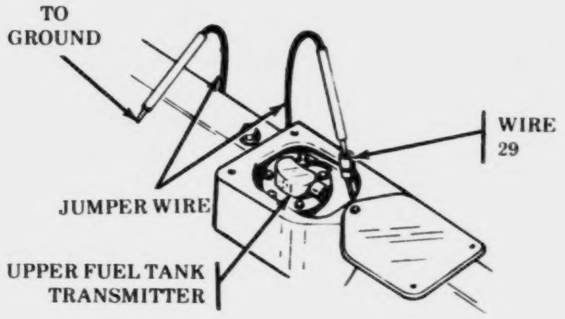
To trace circuits 27 and 28, check wiring harnesses 12260298 (p 6-89) and 12260287 (p 6-84).

C Disconnect wire 28 from FUEL LEVEL indicator. Place red multimeter lead in wire 28, ground black lead, and check for voltage. If voltage is present, replace FUEL LEVEL indicator (p 6-21). If no voltage, repair or replace wires 27 and 28.



D Reconnect wire 29-31. Place FUEL GAGE switch in the UPPER position. Disconnect wire 29 from FUEL GAGE switch. Turn MASTER switch ON and place FUEL GAGE switch in UPPER position. If indicator shows a maximum reading, use a jumper and ground FUEL GAGE switch. If indicator shows a minimum reading, reconnect wire 29 and go to step E. If indicator fails to show a minimum or maximum reading, replace FUEL GAGE switch (p 6-19).

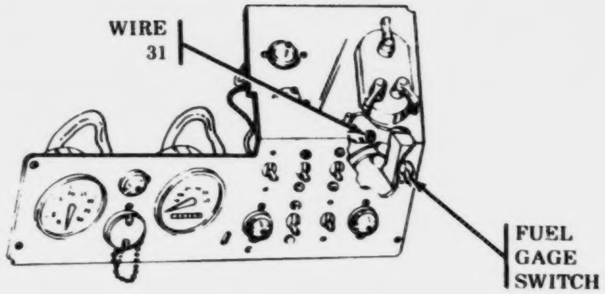
TA310505



NOTE

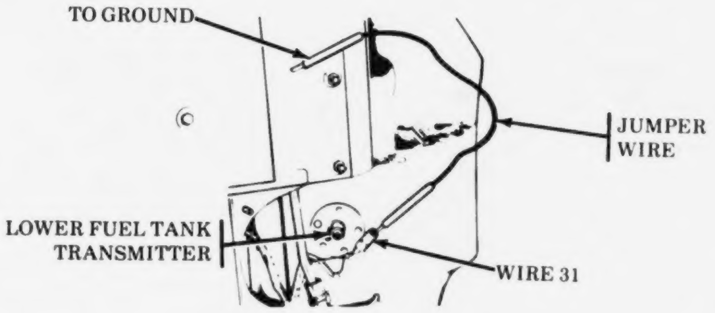
If it is determined circuit 29 of cargo compartment main wiring harness (12330252) is defective, notify Support Maintenance.

E Remove access cover from shroud (p 4-7). Disconnect wire 29 at upper fuel tank transmitter. Turn MASTER switch ON. If FUEL LEVEL indicator shows a maximum reading, use jumper wire to ground wire 29. If indicator shows a minimum reading, replace upper fuel tank transmitter (p 4-8). If indicator fails to show a minimum or maximum reading, repair or replace wire 29 (p 6-72).



F Place FUEL GAGE switch in LOWER position. Disconnect wire 31 from switch. Turn MASTER switch ON. If FUEL LEVEL indicator shows a maximum reading, use a jumper and ground FUEL GAGE switch. If indicator shows a minimum reading, reconnect wire 31 and go to step G. If indicator fails to show a minimum or maximum reading, replace FUEL GAGE switch (p 6-19).

TA310506


TO GROUND
JUMPER WIRE
LOWER FUEL TANK TRANSMITTER
WIRE 31

NOTE

If it is determined circuit 31 of cargo compartment main wiring harness (12330252) is defective, notify Support Maintenance.

G Remove access cover from shroud (p 4-8). Disconnect wire 31 at lower fuel tank transmitter. Turn MASTER switch ON. If FUEL LEVEL indicator shows a maximum reading, use a jumper wire and ground wire 31. If indicator shows a minimum reading, replace lower fuel tank tranmsitter (p 4-8). If indicator fails to show a minimum or maximum reading, repair or replace wire 31 (p 6-72).

TA310507

SERVICE HEADLIGHTS, TAILLIGHTS, AND STOPLIGHTS

ALL LIGHTS ARE OUT
Do steps A and B.

HEADLIGHTS ARE OUT
Do steps C through F.

ONE BEAM ONLY ON HEADLIGHT OPERATES
Do step G.

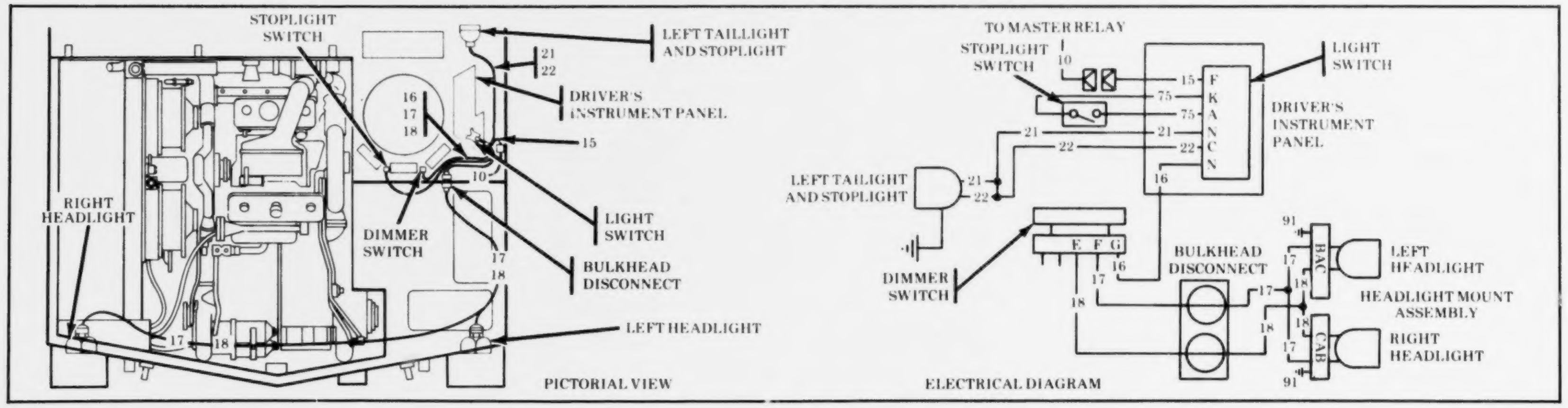
RIGHT OR LEFT HEADLIGHT IS OUT
Do steps H and I.

TAILLIGHT IS OUT
Do steps J and K.

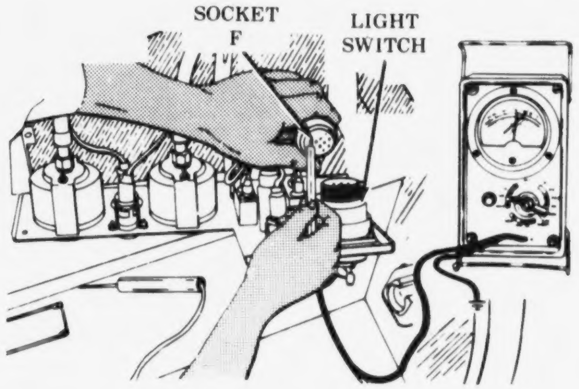
STOPLIGHT IS OUT
Do steps L through P.

START HERE Troubleshoot service headlights, taillights, and stoplights circuitry.

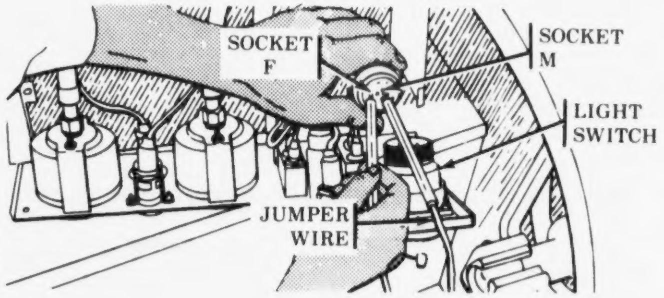
SERVICE HEADLIGHTS, TAILIGHTS, AND STOPLIGHTS CIRCUITS


STOPLIGHT SWITCH
LEFT TAILLIGHT AND STOPLIGHT
21
22
DRIVER'S INSTRUMENT PANEL
16
17
18
15
10
RIGHT HEADLIGHT
DIMMER SWITCH
LIGHT SWITCH
BULKHEAD DISCONNECT
17
18
LEFT HEADLIGHT
17
18
PICTORIAL VIEW
TO MASTER RELAY
STOPLIGHT SWITCH
10
15
75
75
21
22
F
K
A
N
C
N
16
LIGHT SWITCH
DRIVER'S INSTRUMENT PANEL
LEFT TAILIGHT AND STOPLIGHT
21
22
DIMMER SWITCH
E F G
16
17
18
BULKHEAD DISCONNECT
91
17
BAC
18
17
18
CAB
17
91
LEFT HEADLIGHT
HEADLIGHT MOUNT ASSEMBLY
RIGHT HEADLIGHT
ELECTRICAL DIAGRAM

TA310508



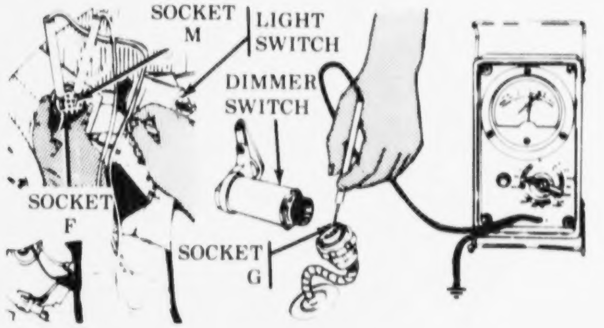
A Disconnect connector at light switch (p 6-19) and turn MASTER switch ON. Using a multimeter, place red lead in socket F and black lead to ground. If multimeter indicates zero volts, wire 15 from connector to junction of wires 15 and 10 is defective. Notify Support Maintenance. If multimeter indicates voltage, go to step B.



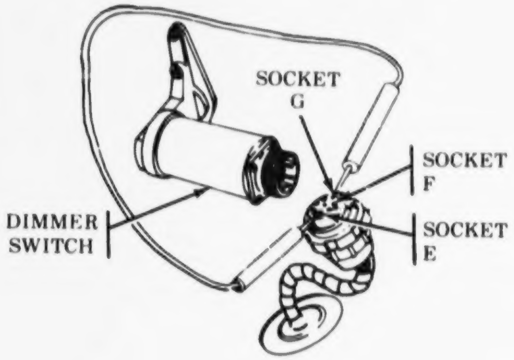
B Using jumper wire, connect socket F to socket M of light switch connector. If lights come on, replace light switch (p 6-21). If headlights fail to come on, go to step D.

C Disconnect connector at light switch and turn MASTER switch ON. Using jumper wire, connect socket F to socket M. If headlights come on, replace light switch (p 6-21). If headlights fail to come on, go to step D.

TA310509


SOCKET
M
LIGHT
SWITCH
DIMMER
SWITCH
SOCKET
F
SOCKET
G

D With jumper wire connecting sockets F and M of light switch, place red multimeter lead in socket G of dimmer switch connector and ground black lead. If no voltage, wire 16 from DIMMER SWITCH to light switch is defective. Notify Support Maintenance. If voltage is present, go to step E.

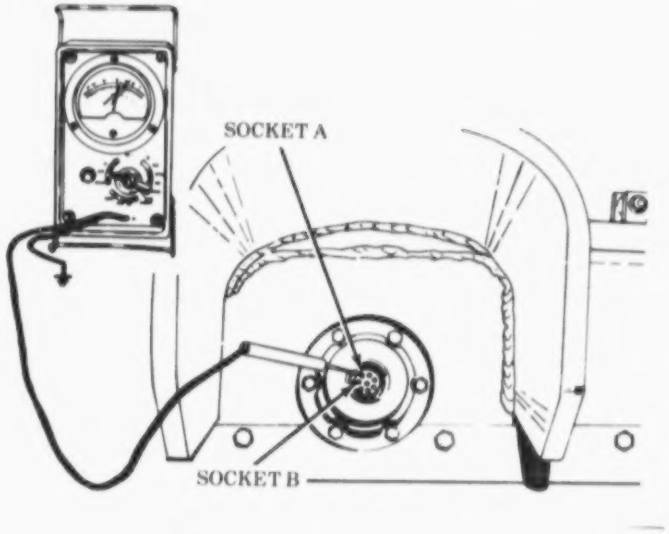

SOCKET
G
SOCKET
F
SOCKET
E
DIMMER
SWITCH

NOTE

Light switch in SER drive position.

E Remove jumper wire from sockets F and M and reconnect light switch connector. Using jumper wire, connect socket G to socket F of dimmer switch connector. Repeat test with jumper wire connecting sockets G and E of dimmer switch connector. If headlights come on, replace DIMMER SWITCH (p 6-38). If headlights fail to come on, go to step F.

TA310510



NOTE

To trace circuits 17 and 18, check harness 10921380 (p 6-72). If cargo compartment main wiring harness 12330252 is defective, notify Support Maintenance.

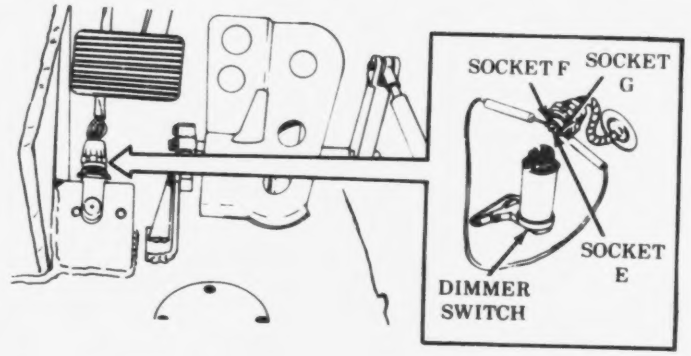
NOTE

Light switch in SER DRIVE position.

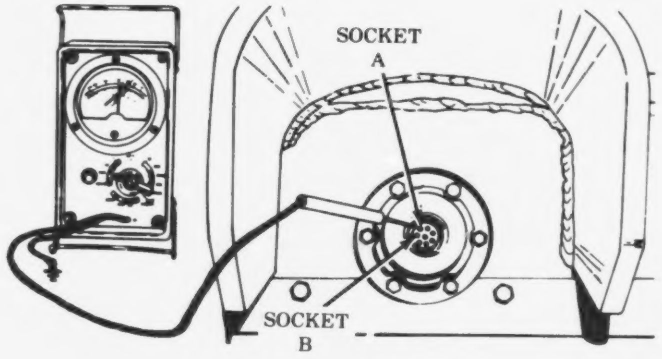
F Reconnect dimmer switch connector and remove headlight assembly. Using multimeter, check for voltage in sockets B and A. If no voltage, repair or replace wires 17 and 18 from headlight assembly to DIMMER SWITCH. If voltage is present, replace headlights (p 6-31).

G Both headlight assemblies have identical wiring. For troubleshooting the right or left headlight, follow same procedure. Remove inoperative headlight assembly (p 6-30) and turn headlight switch on. If low beam is inoperative, place DIMMER SWITCH in low beam position and test for voltage at socket A. If no voltage in socket A, repair or replace wire 18. If high beam is inoperative, place DIMMER SWITCH in the high beam position and check for voltage in socket B. If no voltage in socket B, repair or replace wire 17. If voltage is present, replace sealed beam unit (p 6-31).

TA310511



H Disconnect dimmer switch connector. Turn MASTER switch ON and place light switch in SER DRIVE position. If low beam is defective, use jumper wire to connect socket G to socket E. If high beam is defective, connect socket G to socket F. If headlights come on, replace DIMMER SWITCH (p 6-38). If headlights fail to come on, reconnect dimmer switch connector and go to step I.

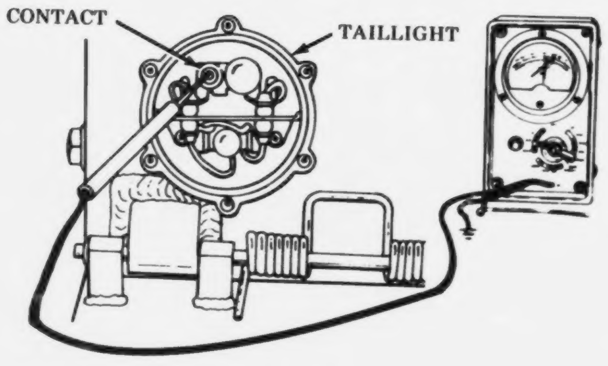


NOTE

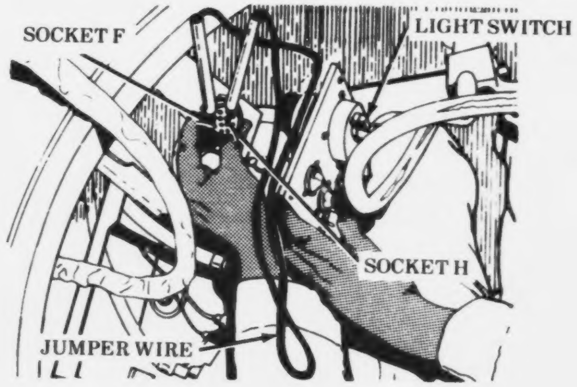
To trace circuits 17 and 18, check harness 10921380 (p 6-72). If cargo compartment main wiring harness 12330252 is defective, notify Support Maintenance.

I Remove headlight assembly (p 6-29). If low beam is defective, place red multimeter lead in socket A and black lead to ground. If high beam is inoperative, place red lead in socket B and black lead to ground. Check for voltage. If no voltage, repair or replace wire 18 for defective low beam circuit and wire 17 for defective high beam circuit. If voltage is present, replace both sealed beam units (p 6-31).

TA310512

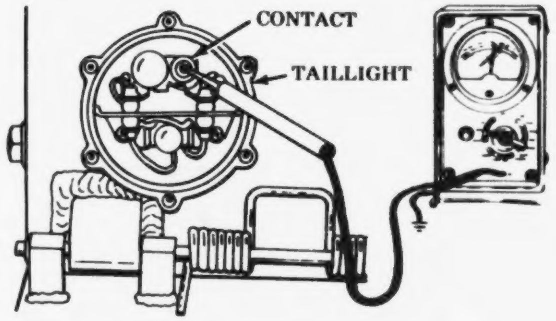

CONTACT
TAILLIGHT

J Remove taillight cover (p 6-36) and turn MASTER switch ON. Turn light switch to SER DRIVE position. Remove taillight bulb (p 6-36). Using multimeter, place red lead in center contact and ground black lead. If voltage is present, replace taillight bulb (p 6-36). If no voltage, replace bulb in socket and go to step K.

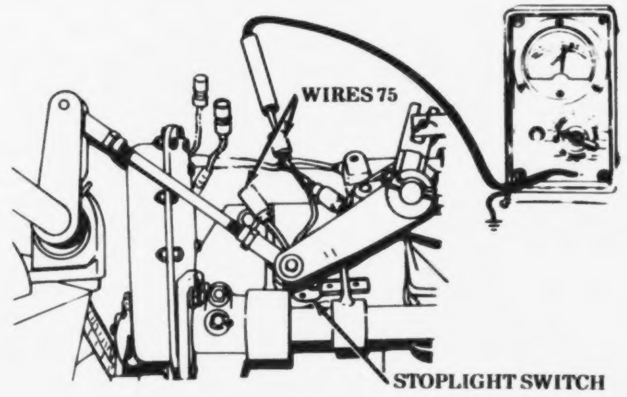

SOCKET F
LIGHT SWITCH
SOCKET H
JUMPER WIRE

K Disconnect light switch connector (p 6-21). Using jumper wire, connect socket F to socket H. If taillight operates, replace light switch (p 6-21). If taillight fails to operate, wire 21 is defective. Notify Support Maintenance.

TA310513

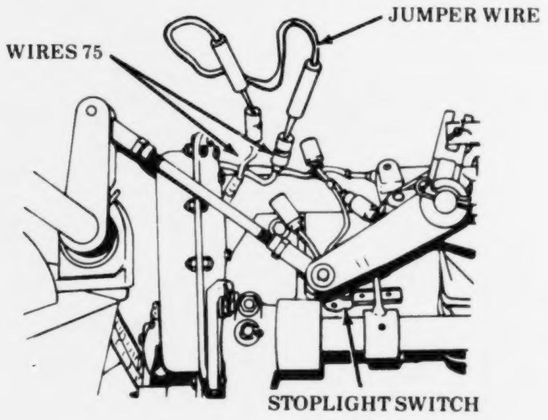


L Remove taillight cover (p 6-36) and turn MASTER switch ON. Turn light switch to SER DRIVE position. Apply parking brake and remove stoplight bulb. Using multimeter, place red lead in center contact and ground black lead. If voltage is present, replace bulb (p 6-36). If no voltage, install stoplight bulb and go to step M.

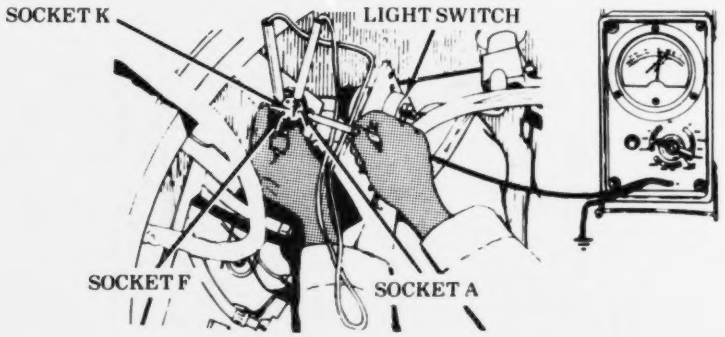


M Disconnect wires 75 at stoplight switch (p 6-38). Place red multimeter lead in one of the no. 75 wires and ground black lead. Check for voltage. Repeat for second wire. If voltage is present on one wire, go to step N. If no voltage, go to step O.

TA310514

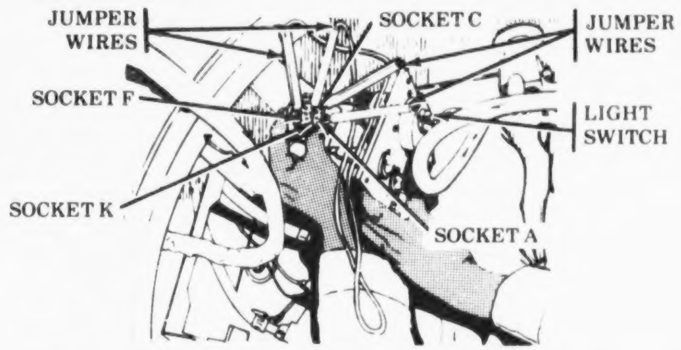

JUMPER WIRE
WIRES 75
STOPLIGHT SWITCH

N Using jumper wire, connect wire 75 to wire 75 at stoplight switch. If stoplight comes on, replace stoplight switch (p 6-38). If stoplight fails to come on, go to step O.


SOCKET K
LIGHT SWITCH
SOCKET F
SOCKET A

O Reconnect both no. 75 wires to stoplight switch and disconnect connector from light switch. Using jumper, connect socket F of connector to socket K. Then place multimeter red lead in socket A of connector and ground black lead. If no voltage, wire 75 from light switch to stoplight switch is defective. Notify Support Maintenance. If voltage is present, go to step P.

TA310515



P With jumper wire connected to socket F and socket K of light switch connector, connect second jumper wire from socket A to socket C. If stoplight fails to come on, wire 22 from light switch to stoplight is defective. Notify Support Maintenance. If stoplight comes on, replace light switch (p 6-38). Reconnect all wires.

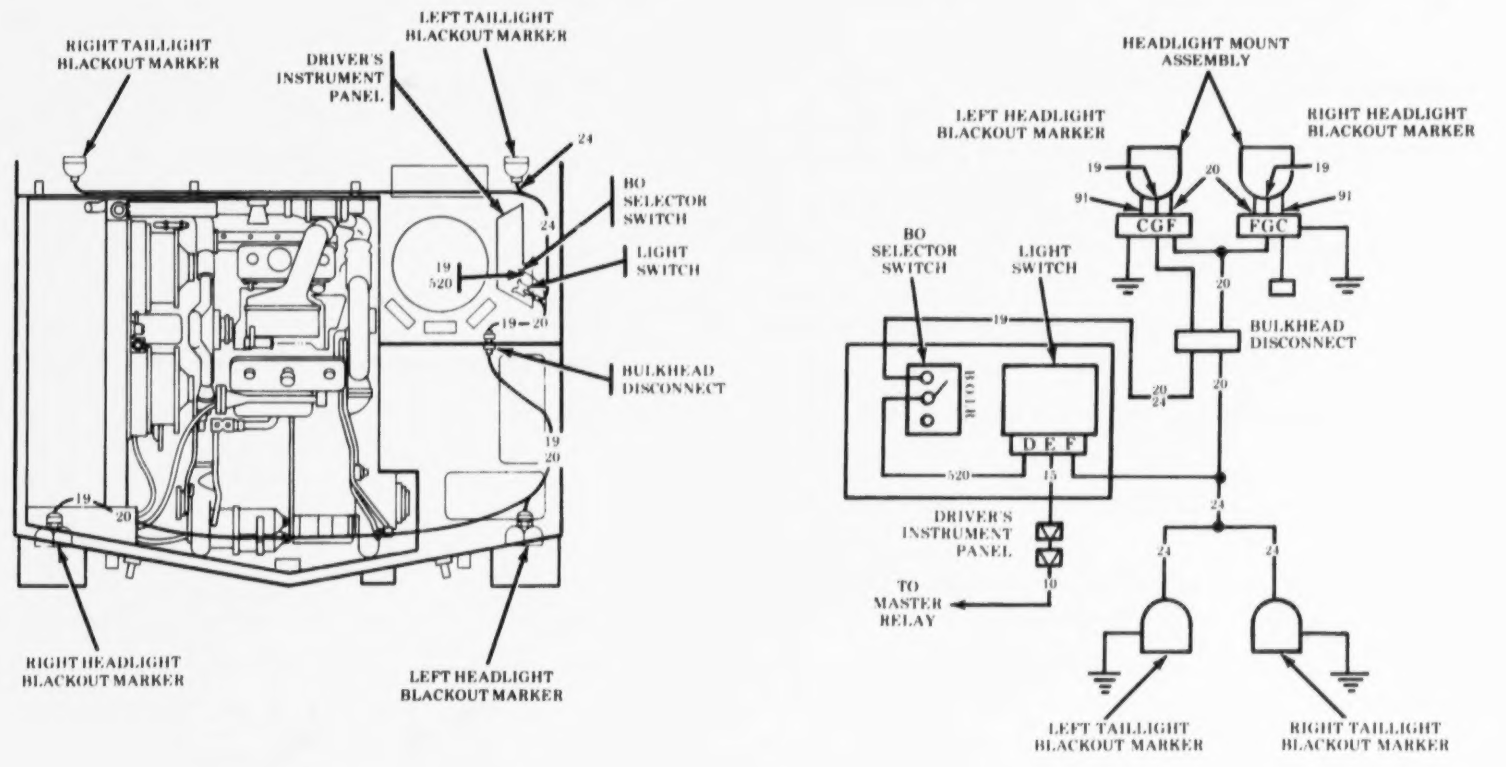
BLACKOUT MARKER AND BLACKOUT DRIVE LIGHTS	**BLACKOUT MARKER LIGHTS ARE OUT** Do steps A and B. **FRONT BLACKOUT MARKERS ARE OUT** Do step C. **RIGHT OR LEFT FRONT BLACKOUT MARKER IS OUT** Do step D. **REAR BLACKOUT MARKERS ARE OUT** Do step E. **RIGHT OR LEFT REAR BLACKOUT MARKER IS OUT** Do step F. **BLACKOUT DRIVE LIGHT IS OUT** Do steps G through J.

START HERE

Troubleshoot blackout markers and blackout drive lights circuits.

TA310516

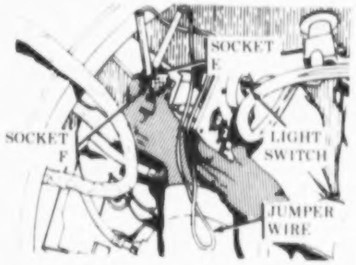
BLACKOUT MARKERS AND BLACKOUT DRIVE LIGHTS CIRCUITS


RIGHT TAILLIGHT BLACKOUT MARKER
LEFT TAILLIGHT BLACKOUT MARKER
DRIVER'S INSTRUMENT PANEL
24
BO SELECTOR SWITCH
24
19
520
LIGHT SWITCH
19—20
BULKHEAD DISCONNECT
19
20
19
20
RIGHT HEADLIGHT BLACKOUT MARKER
LEFT HEADLIGHT BLACKOUT MARKER
HEADLIGHT MOUNT ASSEMBLY
LEFT HEADLIGHT BLACKOUT MARKER
RIGHT HEADLIGHT BLACKOUT MARKER
19
20
19
91
91
CGF
FGC
20
BO SELECTOR SWITCH
LIGHT SWITCH
19
BULKHEAD DISCONNECT
BOLR
20
24
20
D E F
520
15
24
DRIVER'S INSTRUMENT PANEL
24
24
10
TO MASTER RELAY
LEFT TAILLIGHT BLACKOUT MARKER
RIGHT TAILLIGHT BLACKOUT MARKER

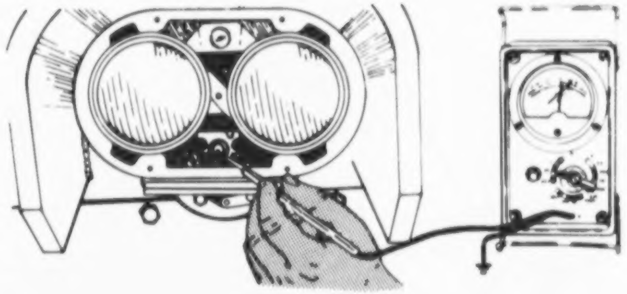
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA58108



A Disconnect light switch connector (p 6-19). Use jumper wire to connect sockets F and E. Turn MASTER switch ON. If blackout (BO) marker lights come on, replace light switch (p 6-21). If BO marker lights fail to come on, go to step B.



NOTE

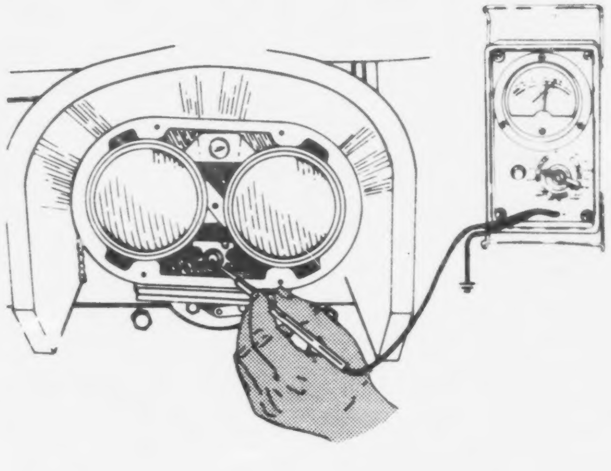
To trace circuits 20 and 19, check harness 10921380 (p 6-72). If cargo compartment main wiring harness 12330252 is defective, notify Support Maintenance.

B Remove cover from one BO marker and remove bulb (p 6-31). Use jumper to connect light switch sockets F and E. Turn MASTER switch ON. Place red multimeter lead on BO marker center contact and ground black lead. If voltage is present, replace bulb (p 6-31). If no voltage, repair or replace wire 20 and wire 19.

NOTE

If step B corrects condition on one light, repeat procedure for all marker lights.

TA310518

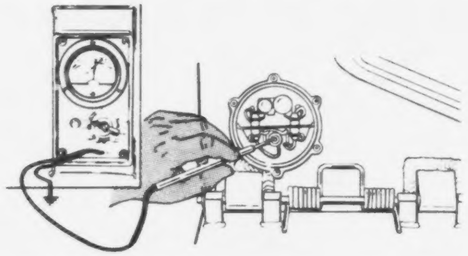


NOTE

To trace circuit 20, check wiring harness 10921380 (p 6-72). If cargo compartment main wiring harness 12330252 is defective, notify Support Maintenance.

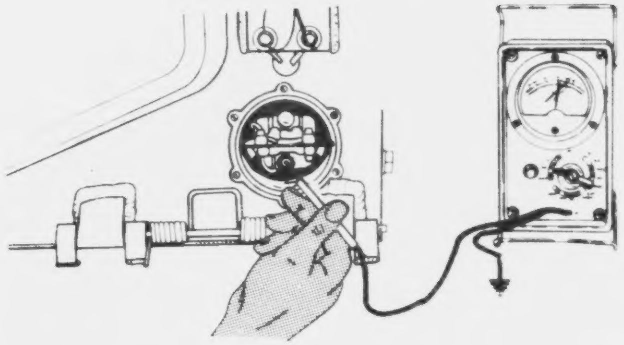
C Remove cover from front blackout (BO) marker lights and remove bulbs (p 6-31). Using multimeter, place red lead in BO marker center contact and black lead to ground. Turn MASTER switch ON and move light switch to BO MARKER position. If voltage is present, replace light bulbs (p 6-31). If no voltage, repair or replace wire 20 from both lights.

D Remove cover from inoperative blackout (BO) marker. Then remove BO marker bulb (p 6-31). Turn MASTER switch ON. Move light switch to BO MARKER position. Using multimeter, place red lead in center contact of socket and place black lead to ground. If voltage is present, replace bulb (p 6-31). If no voltage, repair or replace wire 20.

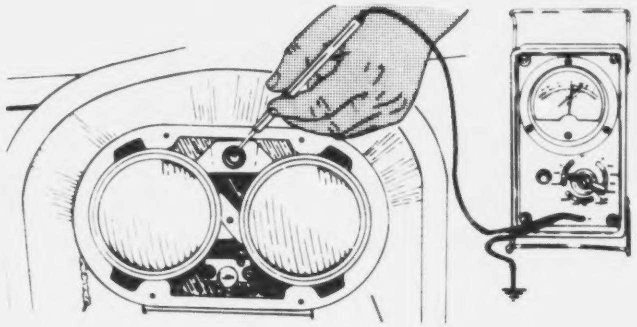


E Remove covers from rear blackout (BO) marker lights and remove BO marker bulbs (p 6-36). Turn MASTER switch ON and move light switch to BO MARKER position. Using multimeter, place red lead in center contact of socket and black lead to ground. If voltage is present, replace bulb (p 6-36). If no voltage, wire 24 is defective. Notify Support Maintenance.

TA310519

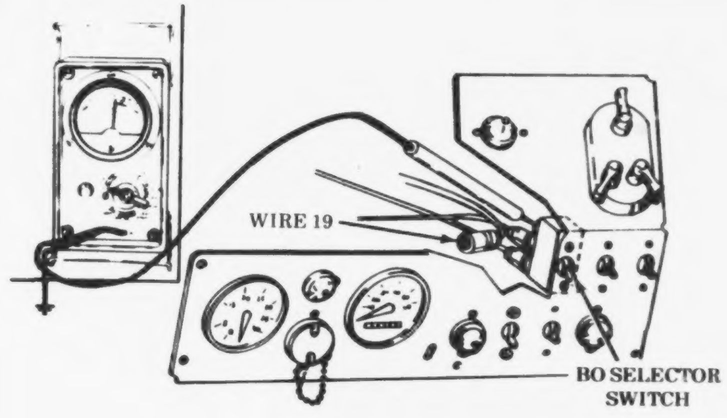


F Remove cover from blackout (BO) marker and remove BO marker bulb (p 6-36). Turn MASTER switch ON and move light switch to BO MARKER position. Using multimeter, place red lead in center contact and black lead to ground. If voltage is present, replace bulb (p 6-36). If no voltage, wire 24 is defective. Notify Support Maintenance.

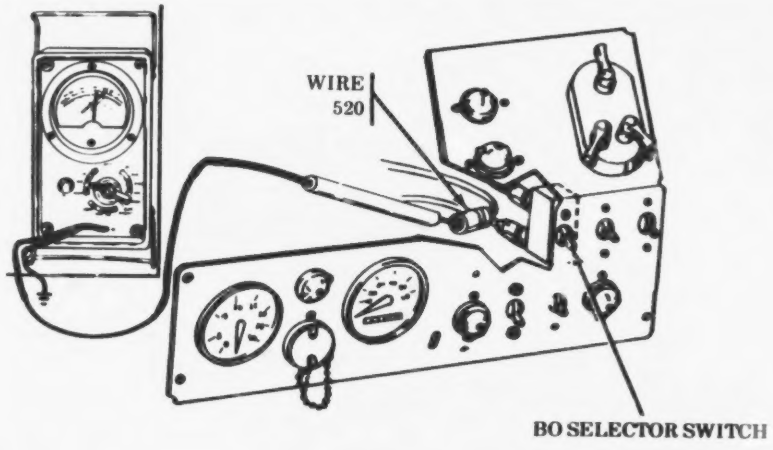


G Remove cover from blackout (BO) drive light and remove BO drive light bulb (p 6-31). Turn MASTER switch ON and move light switch to BO DRIVE position. Then move BO SELECTOR switch to the BOD position. Using multimeter, place red lead in center contact and black lead to ground. If voltage is present, replace bulb (p 6-31). If no voltage, go to step H.

TA310520

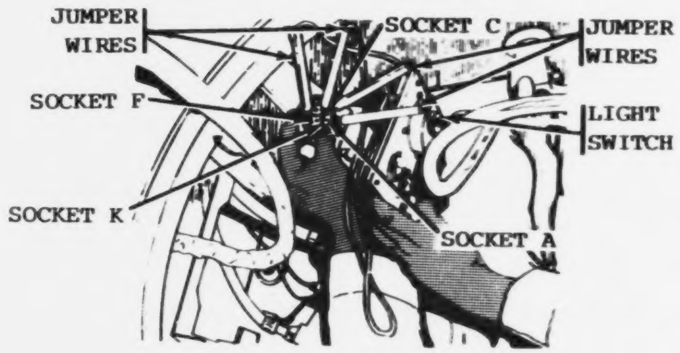

WIRE 19
BO SELECTOR SWITCH

H Disconnect wire 19 from BO SELECTOR switch (p 6-21). Using multimeter, place red lead to switch and black lead to ground. If voltage is present wire 19 is defective. Notify Support Maintenance. If no voltage, go to step I.


WIRE 520
BO SELECTOR SWITCH

I Disconnect wire 520 from BO SELECTOR switch. Using multimeter, place red lead in wire 520 and black lead to ground. If voltage is present, replace BO SELECTOR switch (p 6-21). If no voltage, go to step J.

TA310521


JUMPER WIRES
SOCKET C
JUMPER WIRES
SOCKET F
LIGHT SWITCH
SOCKET K
SOCKET A

J Reconnect all wires and disconnect connector at light switch (p 6-19). Make sure BO SELECTOR switch is in BOD position. Using jumper, connect sockets F and D. If BO drive light comes on, replace light switch (p 6-21). If BO light does not come on, wire 520 is defective. Notify Support Maintenance.

SERVICE BLACKOUT INFRARED HEADLIGHTS

BOTH BEAMS DON'T OPERATE
Do steps A through F.

ONE BEAM DOESN'T OPERATE
Do steps G and H.

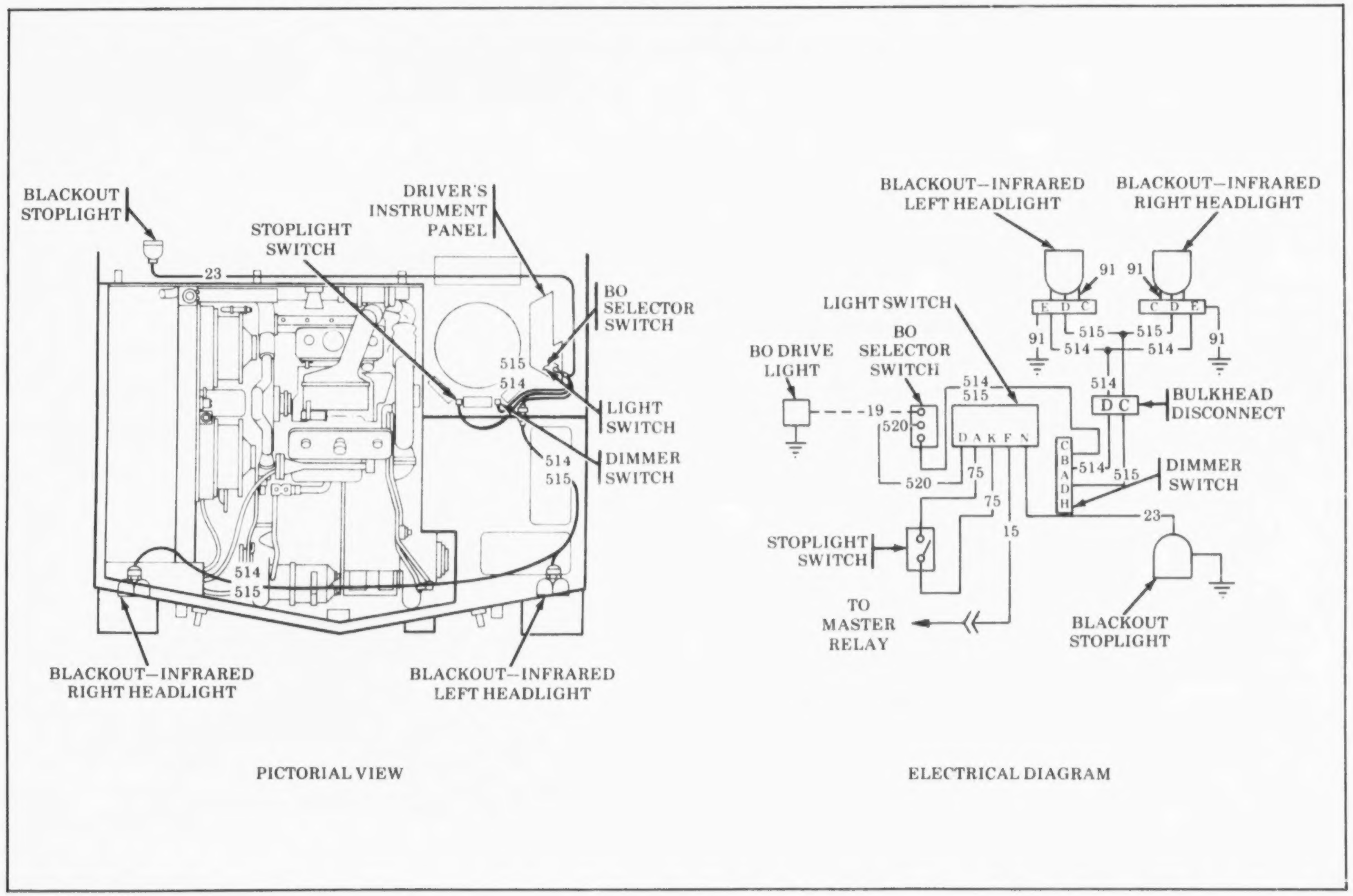
BLACKOUT STOPLIGHT IS OUT
Do steps I and J.

START HERE

Troubleshoot service blackout-infrared headlights and blackout stoplights circuits.

TA310522

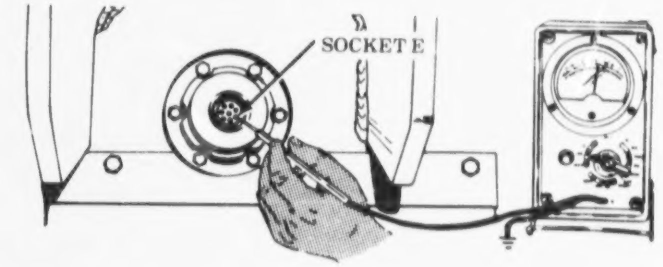
SERVICE BLACKOUT-INFRARED HEADLIGHTS AND BLACKOUT STOPLIGHTS CIRCUITS


BLACKOUT STOPLIGHT
DRIVER'S INSTRUMENT PANEL
STOPLIGHT SWITCH
23
BO SELECTOR SWITCH
515
514
LIGHT SWITCH
DIMMER SWITCH
514
515
514
515
BLACKOUT—INFRARED RIGHT HEADLIGHT
BLACKOUT—INFRARED LEFT HEADLIGHT
BLACKOUT—INFRARED LEFT HEADLIGHT
BLACKOUT—INFRARED RIGHT HEADLIGHT
91
91
E D C
C D E
LIGHT SWITCH
91
515
515
91
514
514
BO DRIVE LIGHT
BO SELECTOR SWITCH
514
515
514
BULKHEAD DISCONNECT
D C
19
520
D A K F N
C B A D H
514
515
DIMMER SWITCH
520
75
75
15
23
STOPLIGHT SWITCH
TO MASTER RELAY
BLACKOUT STOPLIGHT

PICTORIAL VIEW

ELECTRICAL DIAGRAM

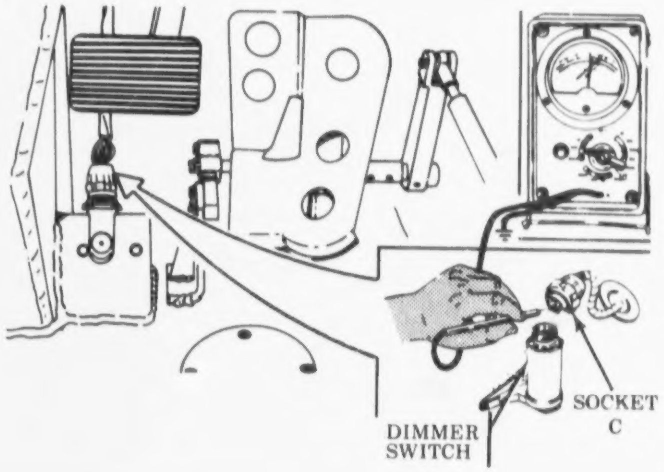
TA58109



NOTE

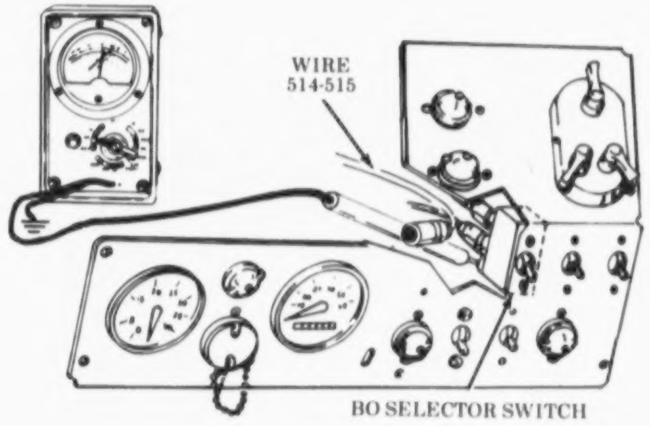
Before performing these steps, ensure that service drive lights are operational.

A Remove blackout-infrared (BO-IR) headlight assembly (p 6-30). Turn MASTER switch ON. Move light switch to BO DRIVE position, and BO SELECTOR switch to IR position. Place red multimeter lead in socket E and ground black lead. If no voltage, push dimmer switch. If voltage is present, replace sealed beam unit (p 6-31). If no voltage, go to step B.

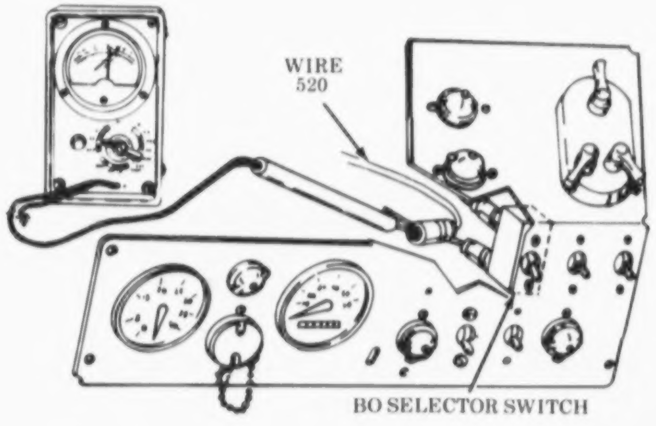


B Disconnect dimmer switch connector. Place red multimeter lead in socket C of connector and ground black lead. If no voltage, go to step C. If voltage is present, go to step F.

TA310524

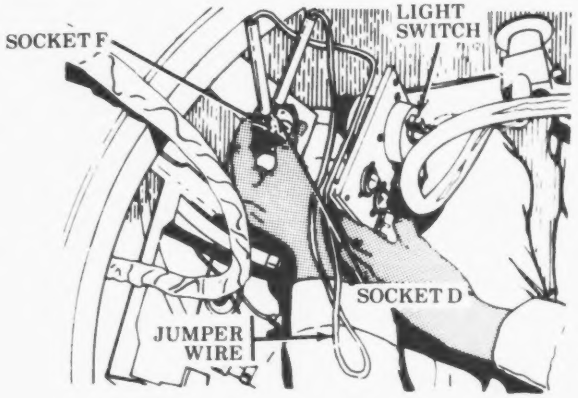

WIRE
514-515
BO SELECTOR SWITCH

C Disconnect wire 514-515 at BO SELECTOR switch. With switch in IR position, place red multimeter lead on switch terminal and ground black lead. If voltage is present, wire 514-515 is defective. Notify Support Maintenance. If no voltage, go to step D.

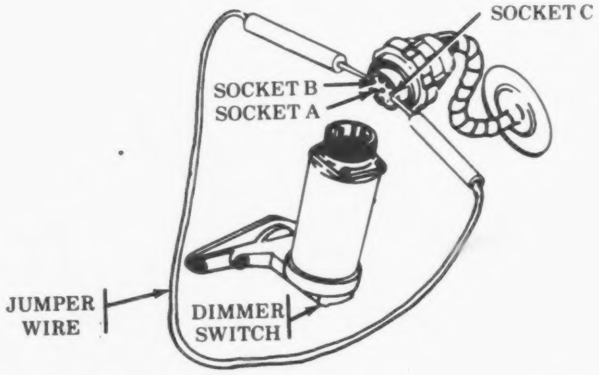

WIRE
520
BO SELECTOR SWITCH

D Disconnect wire 520 from BO SELECTOR switch. Place red multimeter lead in wire 520 and ground black lead. If voltage is present, replace BO SELECTOR switch (p 6-21). If no voltage, go to step E.

TA310525


SOCKET F
LIGHT SWITCH
SOCKET D
JUMPER WIRE

E Reconnect all wires. Disconnect light switch connector. Using jumper wire, connect socket F to socket D. If IR lights operate, replace light switch (p 6-21). If IR lights fail to operate, wire 520 is defective. Notify Support Maintenance.

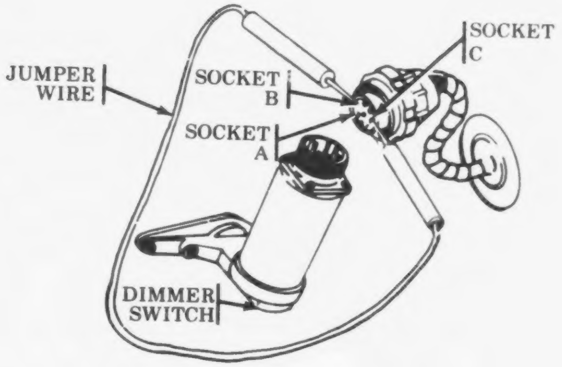

SOCKET C
SOCKET B
SOCKET A
JUMPER WIRE
DIMMER SWITCH

NOTE

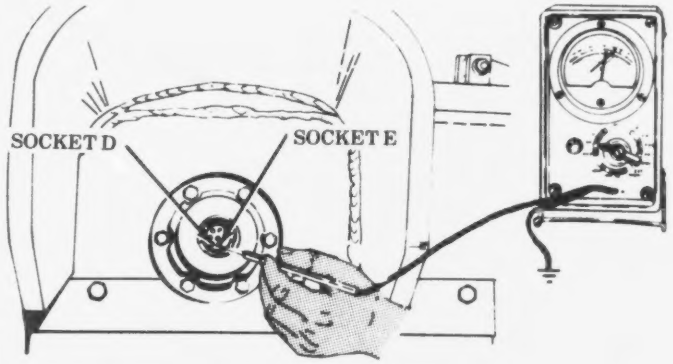
To trace circuits 514 and 515, check harness 10921380 (p 6-72). If cargo compartment main wiring harness (12330252) is defective, notify Support Maintenance.

F Using jumper, connect socket C of dimmer switch connector to socket B and then to socket A. If IR lights fail to operate when socket C is connected to socket B, repair or replace wire 514. If IR lights fail to operate when socket C is connected to socket A, repair or replace wire 515. If both lights operate when jumper wire is used, replace dimmer switch (p 6-38).

TA310526



G Determine which beam is inoperative by using high beam indicator. Disconnect connector from dimmer switch and using jumper wire, connect socket C of connector to socket B if high beam is inoperative, and to socket A if low beam is inoperative. If lights operate, replace dimmer switch (p 6-38). If lights fail to operate, go to step H.

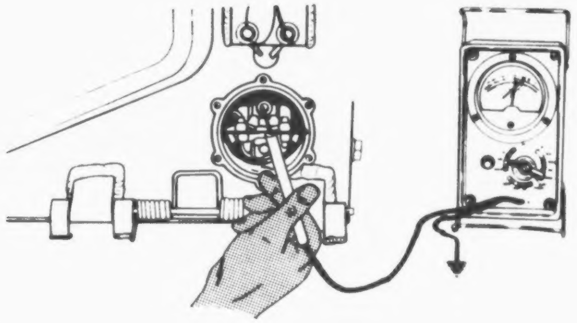


NOTE

To trace circuits 514 and 515, check wiring harness 10921380 (p 6-72). If cargo compartment main wiring harness (12330252) is defective, notify Support Maintenance.

H Remove headlight assembly (p 6-30). If high beam is inoperative, place red multimeter lead in socket E. If low beam is inoperative, place red lead in socket D and ground black lead. If voltage is present, replace sealed beam units (p 6-31). If no voltage, repair or replace wire 515 if low beam is defective or wire 514 if high beam is defective.

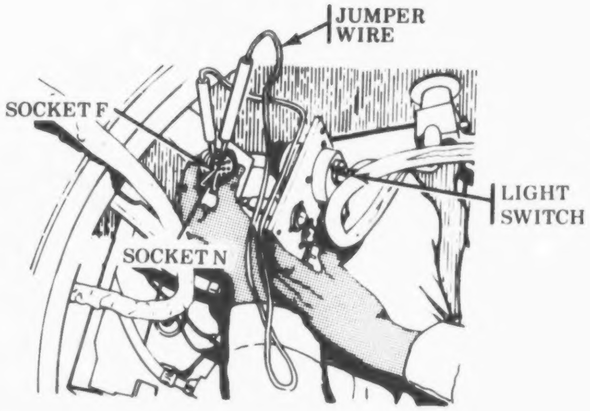
TA310527



NOTE

Before performing these steps, ensure that service stoplight is operational.

I Remove blackout (BO) stoplight bulb. Turn MASTER switch ON. Then move light switch to BO DRIVE position and apply parking brake. Using multimeter, place red lead in center contact and ground black lead. If voltage is present, replace bulb (p 6-36). If no voltage, go to step J.



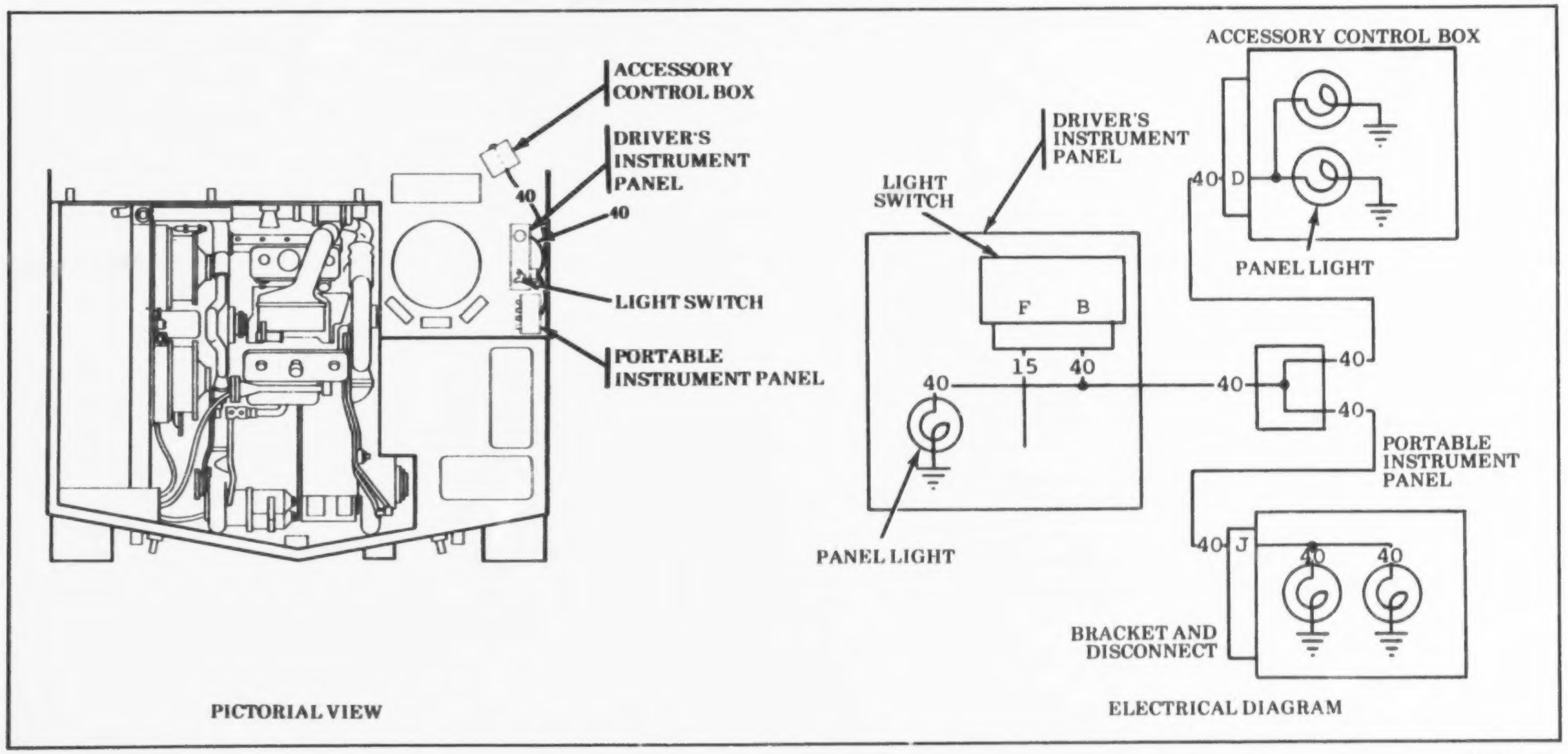
J Disconnect light switch connector. Place jumper wire from socket F to socket N. If BO stoplight operates, replace light switch (p 6-21). Apply brakes. If light fails to operate, wire 23 is defective. Notify Support Maintenance.

TA310528

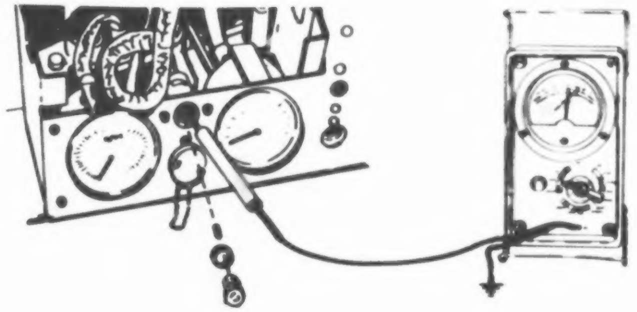
INSTRUMENT PANEL LIGHTS	**ONE OR MORE LIGHTS ARE OUT** **Do step A.** **ALL LIGHTS ARE OUT** **Do step B.**

START HERE Troubleshoot instrument panel light circuit.

INSTRUMENT PANEL LIGHT CIRCUIT


ACCESSORY CONTROL BOX
DRIVER'S INSTRUMENT PANEL
40
40
LIGHT SWITCH
PORTABLE INSTRUMENT PANEL
PICTORIAL VIEW
ACCESSORY CONTROL BOX
DRIVER'S INSTRUMENT PANEL
LIGHT SWITCH
F
B
15
40
40
40
40
40
40
D
PANEL LIGHT
PANEL LIGHT
PORTABLE INSTRUMENT PANEL
40
J
40
40
BRACKET AND DISCONNECT
ELECTRICAL DIAGRAM

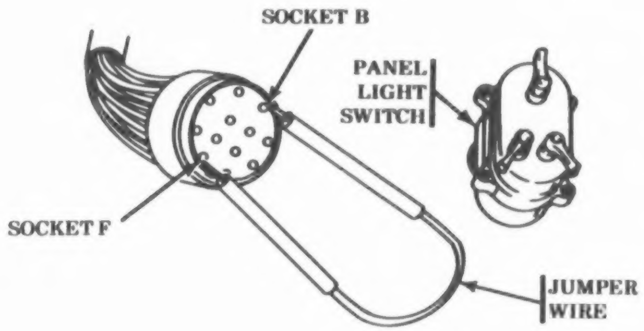
TA310529



NOTE

Before troubleshooting panel lights, be sure that service drive lights are operational.

A Remove inoperative panel light bulb (p 6-21). Turn MASTER switch and panel light switch ON. Using multimeter, place red lead in center contact. Ground black lead. If voltage is present, replace bulb (p 6-21). If no voltage, repair wire 40.



B Disconnect light switch connector and use jumper to connect socket F to socket B. Turn panel lights ON. If panel lights operate, replace light switch. If panel lights fail to operate, repair or replace wire 40 (Appx F).

TA310530

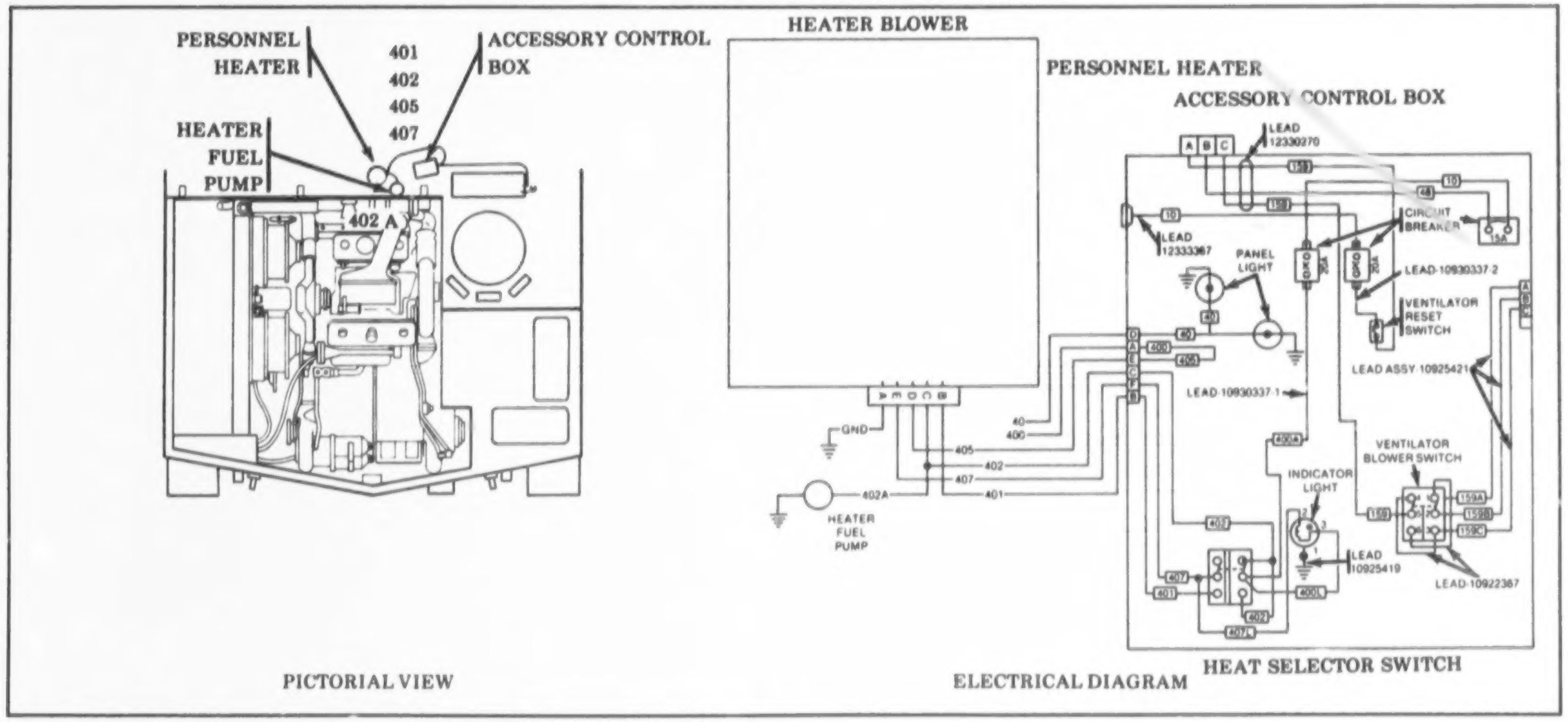
PERSONNEL HEATER	PERSONNEL HEATER DOESN'T OPERATE Do steps A through H.

START HERE

1 Troubleshoot personnel heater circuit.

2 Troubleshoot personnel heater (TM 9-2540-205-24&P).

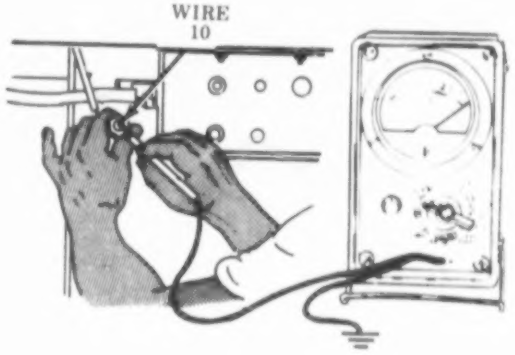
PERSONNEL HEATER CIRCUIT


PERSONNEL HEATER
401
402
405
407
ACCESSORY CONTROL BOX
HEATER FUEL PUMP
402 A
HEATER BLOWER
GND
405
402
407
401
402A
HEATER FUEL PUMP
40
400
PERSONNEL HEATER
ACCESSORY CONTROL BOX
A B C
LEAD 12330270
10
48
159
LEAD 12333367
PANEL LIGHT
CIRCUIT BREAKER
15A
20A
LEAD-10930337-2
VENTILATOR RESET SWITCH
D A E C F B
40
400
405
LEAD ASSY 10925421
LEAD-10930337-1
400A
VENTILATOR BLOWER SWITCH
INDICATOR LIGHT
LEAD 10925419
159A
159B
159C
402
407
401
400L
407L
LEAD-10922367
HEAT SELECTOR SWITCH

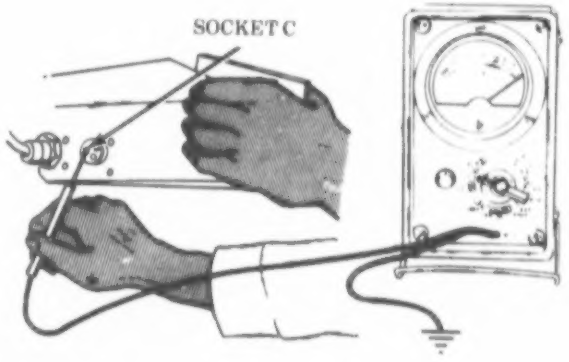
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA58110

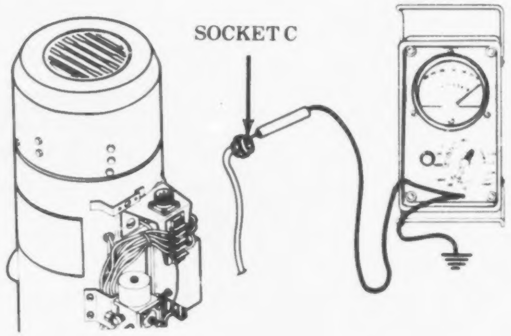


A Disconnect wire 10 at accessory control box. Place MASTER switch ON. Place red lead of multimeter on wire 10 socket in connector. If voltage is not present, repair or replace wire 10 (p 6-77). If voltage is present, reconnect wire 10 to accessory control box and go to step B.

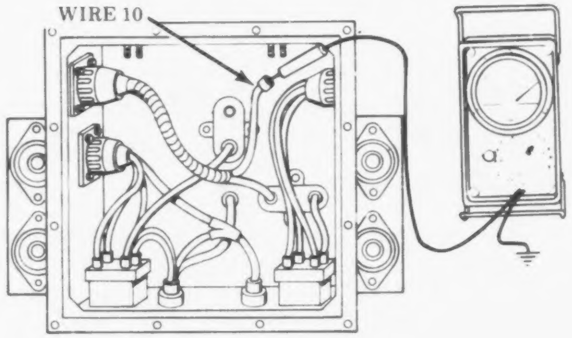


B Disconnect wiring harness at accessory control box. Place MASTER switch ON, HEATER SELECTOR switch LOW. Place red lead of multimeter in socket C (wire 402) of accessory control box and black lead to ground. If voltage is not present, go to step D. If voltage is present, go to step C.

TA310532

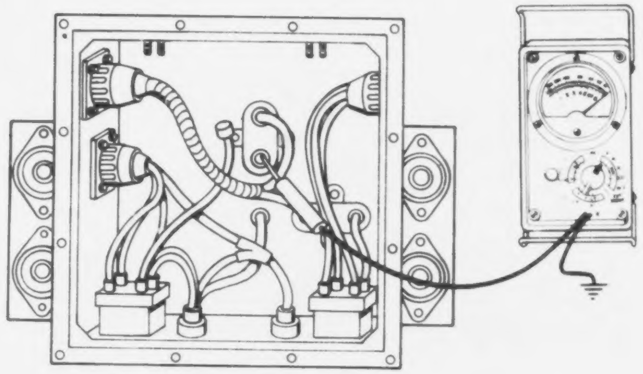


C Reconnect harness at accessory control box. Disconnect wiring harness and personnel heater. MASTER switch ON, HEAT SELECTOR switch LOW. Place red lead of multimeter in socket C (wire 402) and black lead to ground. Check for voltage. Repeat voltage check on socket D (wire 405). If voltage is not present in both wires, repair or replace defective wires (p 6-100). If voltage is present reconnect harness and troubleshoot personnel heater circuitry (TM 9-2540-205-24&P).

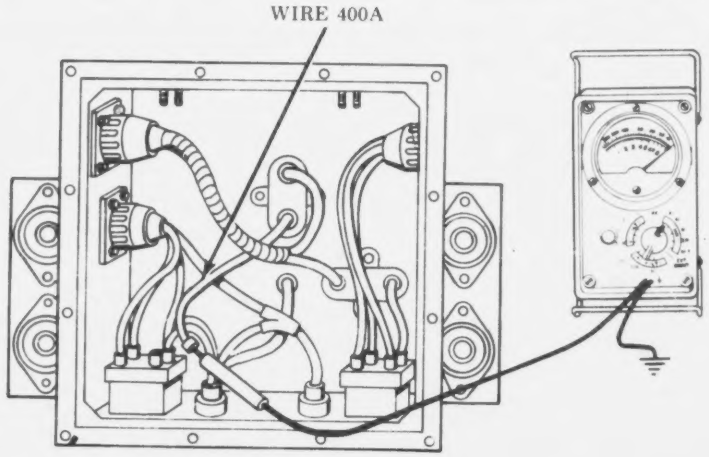


D Remove accessory control box (p 6-26). Remove cover and disconnect wire 10 from circuit breaker. Place MASTER switch ON. Place red lead of multimeter in wire 10 connector and black lead to ground. If voltage is not present, replace wire 10 in accessory control box (p 6-26). If voltage is present, go to step E.

TA310533

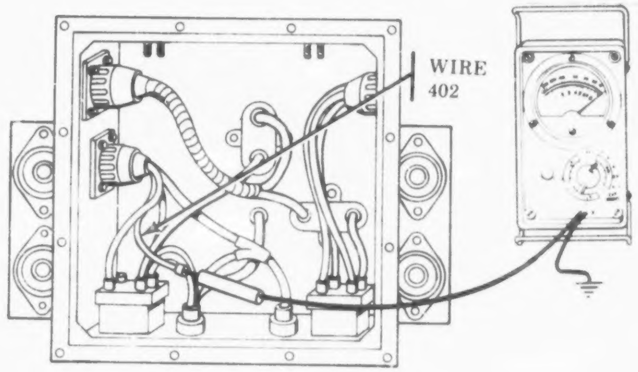


E Disconnect wire 400 from circuit breaker. Place MASTER switch ON. Place red lead of multimeter in circuit breaker terminal and black lead to ground. If voltage is not present, replace circuit breaker (p 6-26). If voltage is present, go to step F.

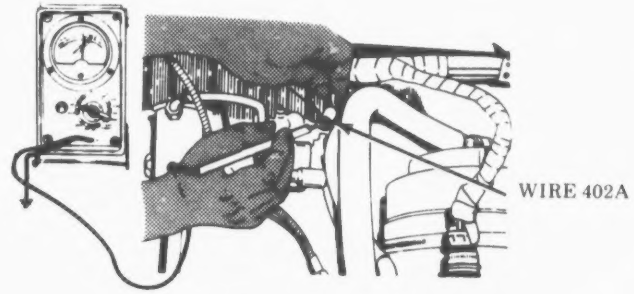


F Place red lead of multimeter on HEAT SELECTOR switch (input wire 400) and black lead to ground. If voltage is not present, repair or replace wire 400 (p 6-26). If voltage is present, go to step G.

TA310534



G Place red lead of multimeter on heat selector switch (output wire 402) and black lead to ground. Move HEAT SELECTOR switch to HIGH and LOW positions (position red lead on HIGH and LOW terminals). If voltage is not present in both positions, replace switch (p 6-26). If voltage is present, go to step H.



H Assemble and install accessory control box (p 6-26). Disconnect wire 402A at personnel heater fuel pump. Place MASTER switch ON, HEAT SELECTOR switch LOW. Place red lead of multimeter in wire 402A connector and black lead to ground. If voltage is not present, replace wire 402A (p 6-100). If voltage is present, replace fuel pump (p 14-71). If heater still does not operate, replace heater (p 14-68).

TA310535

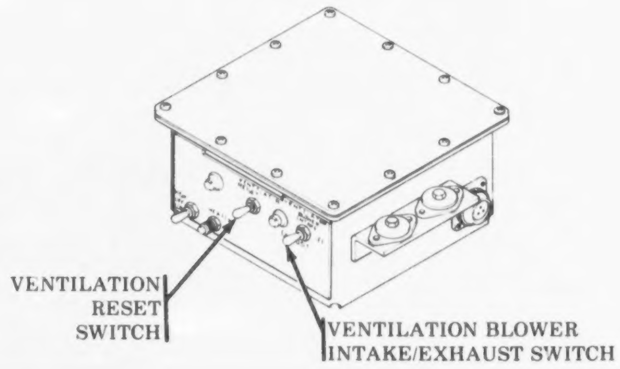
PERSONNEL VENTILATION BLOWER	**VENTILATION BLOWER DOES NOT OPERATE** **Do step A.** **VENTILATION BLOWER OPERATES BUT DOES NOT COME ON AUTOMATICALLY IN EXHAUST MODE DURING AFES TEST** **Do step J.** **VENTILATION BLOWER RESET SWITCH DOES NOT RESET SYSTEM AFTER AFES CREW COMPARTMENT TEST** **Replace ventilation blower reset switch (p 6-26).**

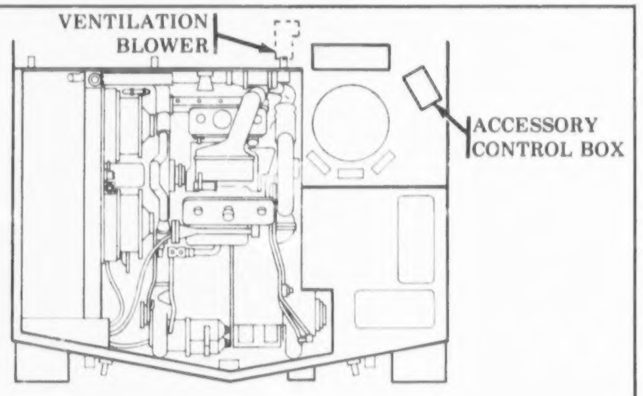
START HERE

1 Turn MASTER switch ON.

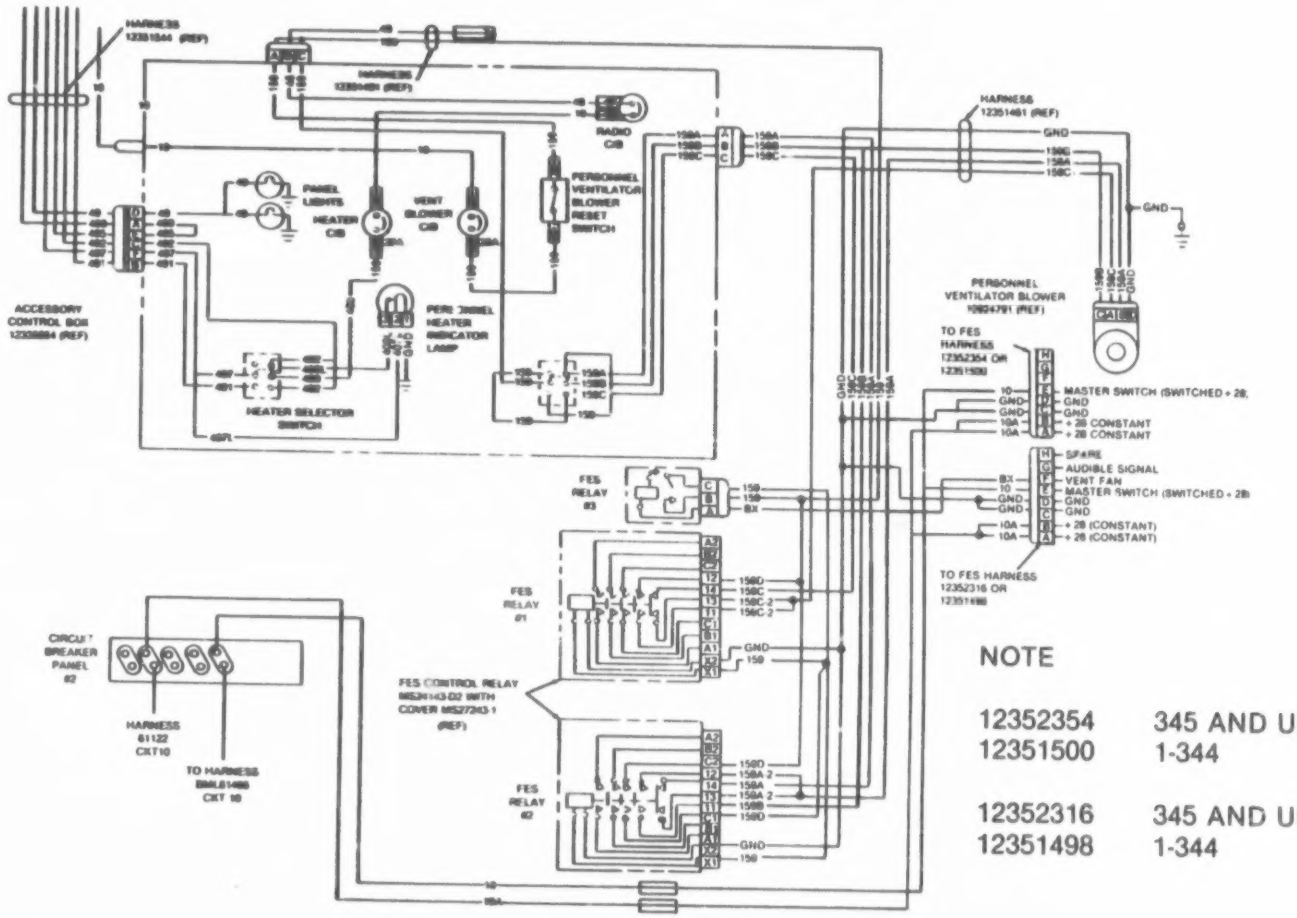
2 Press ventilation blower reset toggle switch on accessory control box.

3 Operate ventilation system in both intake and exhaust modes. If system does not operate in either intake or exhaust, or both, proceed with step A.


VENTILATION RESET SWITCH
VENTILATION BLOWER INTAKE/EXHAUST SWITCH


VENTILATION BLOWER
ACCESSORY CONTROL BOX

TA310536

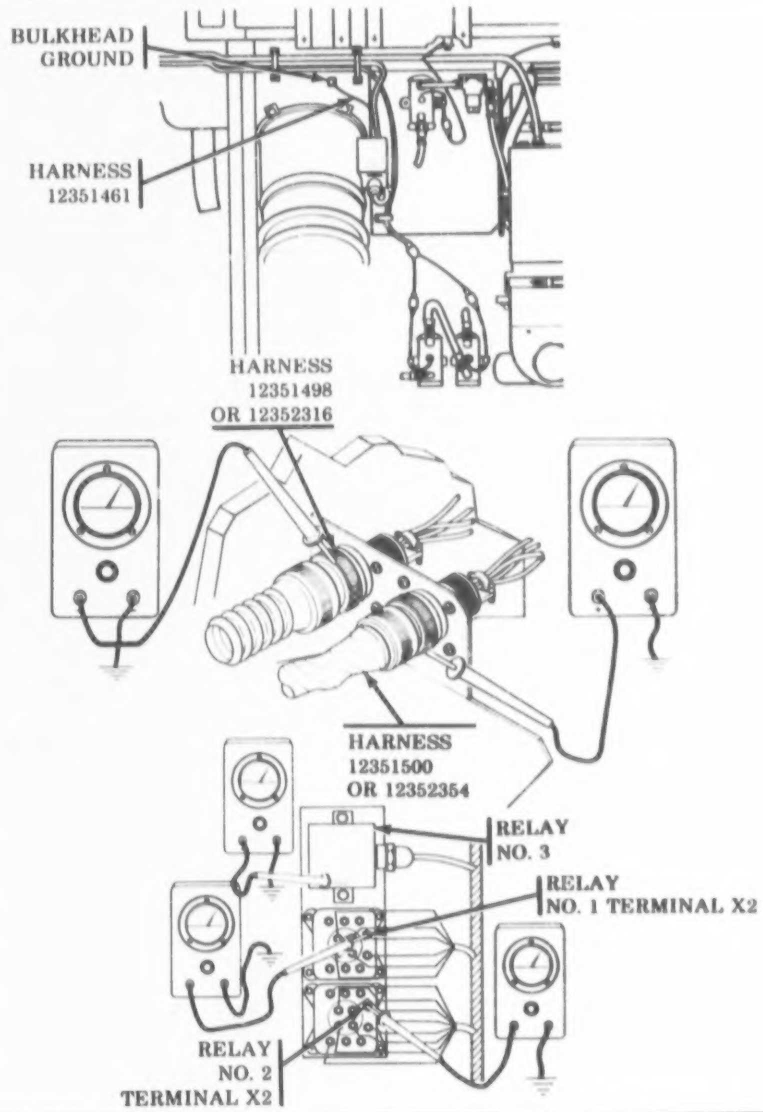

HARNESS
(REF)
HARNESS
(REF)
RADIO C/B
PANEL LIGHTS
HEATER C/B
VENT BLOWER C/B
PERSONNEL VENTILATOR BLOWER RESET SWITCH
ACCESSORY CONTROL BOX (REF)
PERSONNEL HEATER INDICATOR LAMP
HEATER SELECTOR SWITCH
HARNESS
12351481 (REF)
GND
158A
158B
158C
PERSONNEL VENTILATOR BLOWER
(REF)
TO FES HARNESS
MASTER SWITCH (SWITCHED + 28)
GND
+ 28 CONSTANT
SPARE
AUDIBLE SIGNAL
VENT FAN
MASTER SWITCH (SWITCHED + 28)
+ 28 (CONSTANT)
TO FES HARNESS
FES RELAY #3
FES RELAY #1
FES RELAY #2
FES CONTROL RELAY
COVER
(REF)
CIRCUIT BREAKER PANEL #2
HARNESS
61122
CKT10
TO HARNESS
CKT 10
158D
158C
158C-2
158A
158A-2
158B
BX
150
10
10A

NOTE

12352354	345 AND UP
12351500	1-344
12352316	345 AND UP
12351498	1-344

SCHEMATIC DIAGRAM

TA57341


BULKHEAD GROUND
HARNESS 12351461
HARNESS 12351498 OR 12352316
HARNESS 12351500 OR 12352354
RELAY NO. 3
RELAY NO. 1 TERMINAL X2
RELAY NO. 2 TERMINAL X2

WARNING

Ventilation and Automatic Fire Extinguisher System (AFES) electrical systems are interconnected. Install anti-recoil plugs in AFES crew compartment halon bottle discharge ports. Install safety pin in all AFES bottle actuators. Turn both ENGINE and CREW AFES test and alarm panel MAINT switches to ON position (slot vertical). Disconnect electrical harness plugs from all extinguisher bottle actuators to prevent accidental discharge during troubleshooting procedures.

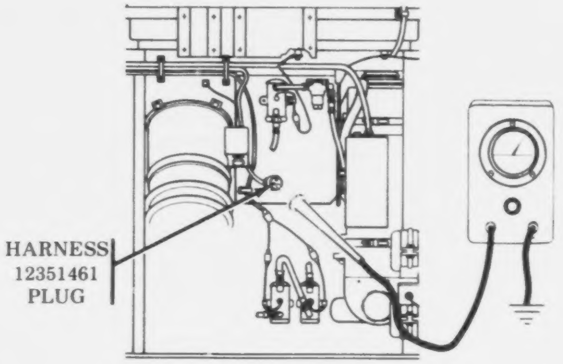
A Turn MASTER switch OFF. Remove AFES relays cover (p 14-35). Remove left projectile rack (p 11-5). Check harness 12351461 ground at bulkhead. Tighten screw to ensure good ground. Check ground between the following points.

Relay no. 1, terminal X2 and chassis.
Relay no. 2, terminal X2 and chassis.

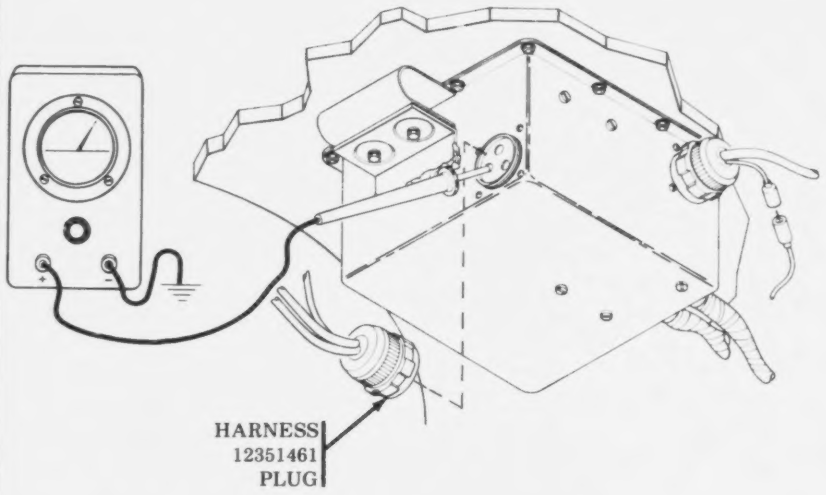
Plug shells at interconnection of harness 12351461 and AFES harnesses 12352316 or 12351498 and 12352354 or 12351500.

Relay no. 3, case and chassis.

Repair ground where possible, otherwise replace electrical harness 12351461 (p 6-93). If grounds check, but blower still does not operate, go to step B.



B Disconnect harness 12351461 plug from ventilation blower motor. Check voltage with multimeter. Place red probe in socket A of plug and ground black probe. Turn MASTER switch ON. Press ventilation blower toggle switch to exhaust position. Place red probe in plug socket B, ground black probe, and press blower toggle switch to intake position. If voltage is indicated in both circuits and blower does not operate, go to step G. If voltage is not indicated in one or both circuits go to step C.



C Turn MASTER switch OFF. Connect plug from harness 12351461 to ventilation blower motor. Disconnect harness 12351461 plug (circuits 159A, 159B, 159C) from accessory control box. Check voltage with a multimeter. Place red probe in accessory control box connector socket C and ground black probe. Turn MASTER switch ON. Place ventilation blower switch in exhaust position. Also check socket A for voltage; place ventilation blower switch in intake position. If voltage is indicated in one circuit only, replace accessory control box personnel ventilator intake and exhaust switch (p 6-26). If no voltage is indicated go to step D. If voltage is indicated in both circuits, and problem is blower will not operate in exhaust mode, go to step E. If problem is blower will not operate in intake mode, go to step F.

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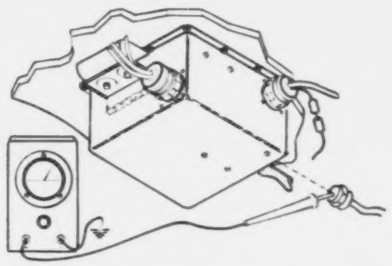
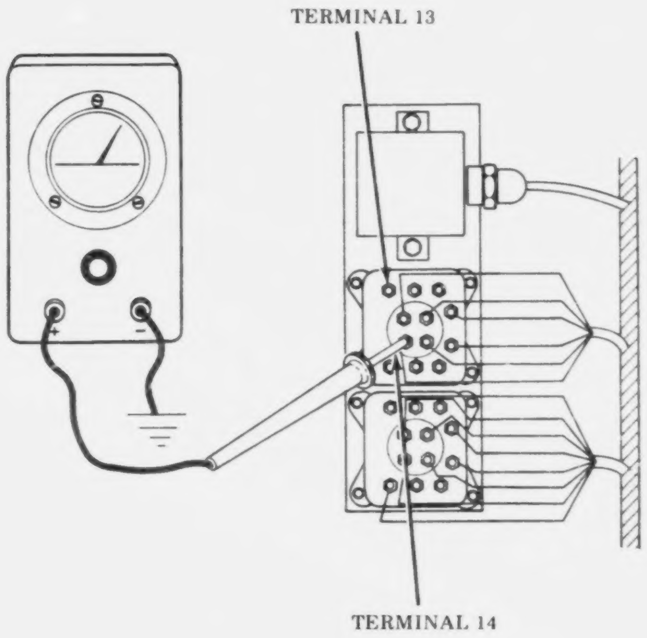


D Turn MASTER switch OFF. Disconnect harness 12330257 circuit 10 plug from accessory control box. Check voltage with a multimeter. Place red probe in harness plug and ground black probe. Turn MASTER switch ON. If voltage is indicated, troubleshoot accessory control box circuitry (p 6-26). If no voltage is indicated, troubleshoot wiring harness 12330257 (p 6-77).

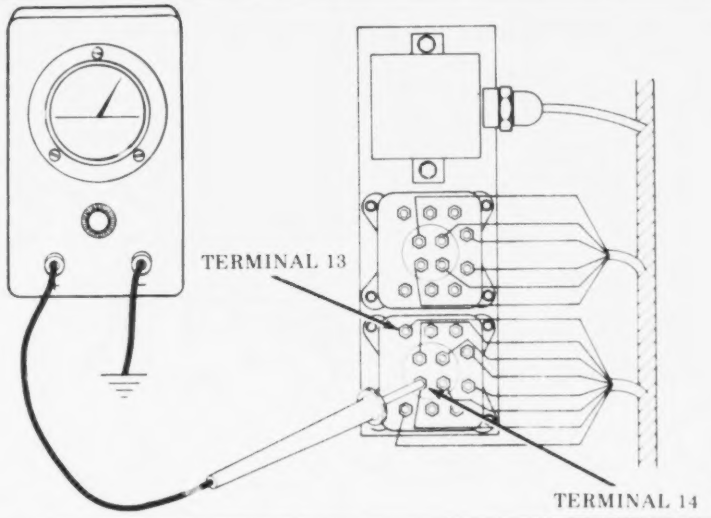


WARNING

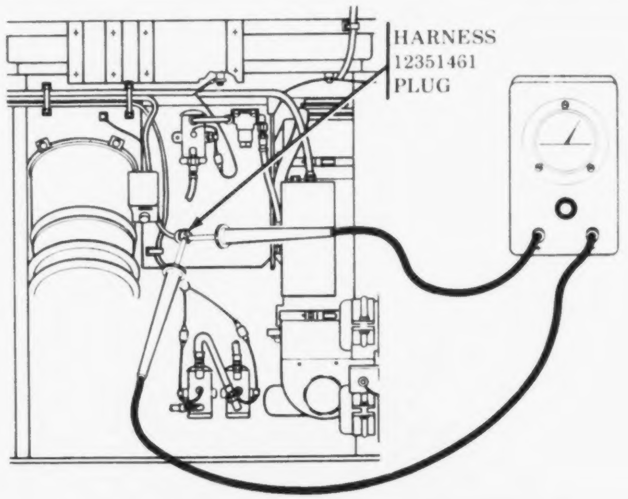
When AFES relays cover is removed, use caution while working around exposed electrical terminals to avoid electrical shock. Do not short out terminals with tools or bare hands.

E Turn MASTER switch OFF. Connect harness 12351461 plug to accessory control box. Disconnect harness 12351461 plug from ventilation blower motor. Check voltage with a multimeter. Place red probe of multimeter on terminal 14 of relay no. 1, and ground black probe. Turn MASTER switch ON. Place ventilation blower toggle switch to exhaust position. If voltage is not indicated, replace harness 12351461 (p 6-93). If voltage is indicated on terminal no. 14, check voltage on terminal 13. If voltage is not indicated on terminal no. 13, replace relay no. 1 (p14-36). If voltage is indicated on terminal no. 13, replace electrical harness 12351461 (p 6-93).

TA310540

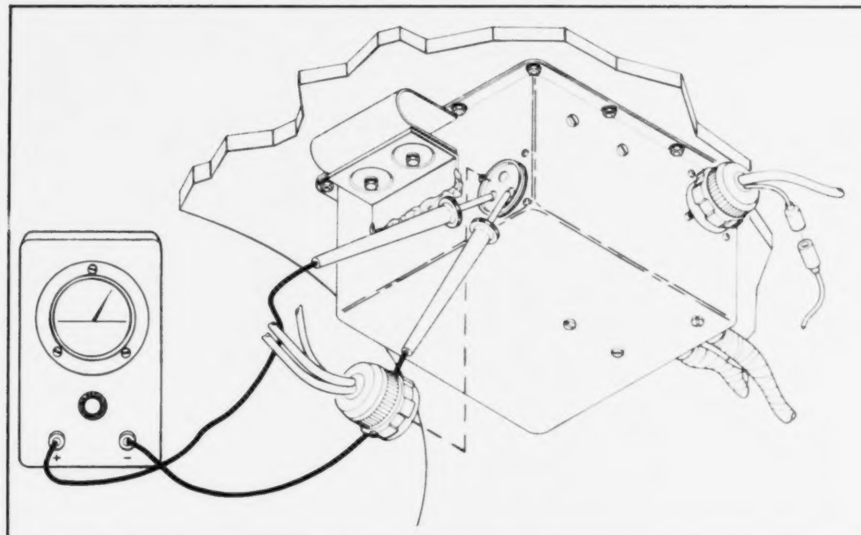


F Turn MASTER switch OFF. Connect harness 12351461 plug to accessory control box. Disconnect harness 12351461 plug from ventilation blower motor. Check voltage with a multimeter. Place red probe of multimeter on terminal 14 of relay no. 2, and ground black probe. Turn MASTER switch ON. Place ventilation blower toggle switch to intake position. If voltage is not indicated, replace harness 12351461 (p 6-93). If voltage is indicated on terminal no. 14, check voltage on terminal 13. If voltage is not indicated on terminal no. 13, replace relay no. 2 (p 14-36). If voltage is indicated on terminal no. 13, replace electrical harness 12351461 (p 6-93).

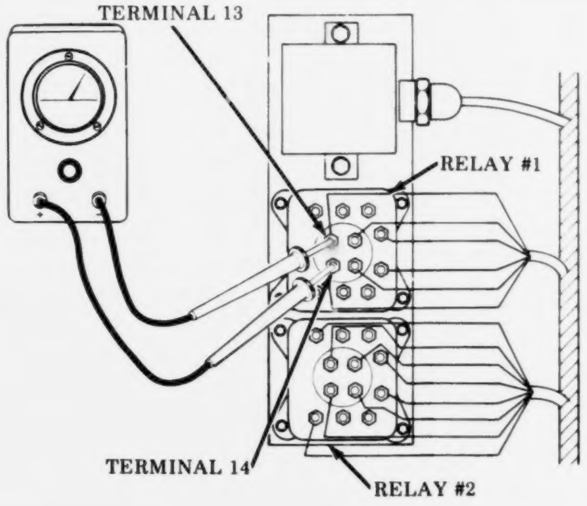


G Turn MASTER switch OFF. Press ventilation blower toggle switch to exhaust position. Check continuity between circuits B and C of harness 12351461 plug. Press ventilation blower toggle switch to intake position. Check continuity between circuits A and C of harness 12351461 plug. If continuity is indicated, replace ventilation blower motor (p 14-63). If continuity is not indicated in one or both circuits, go to step H.

TA310541



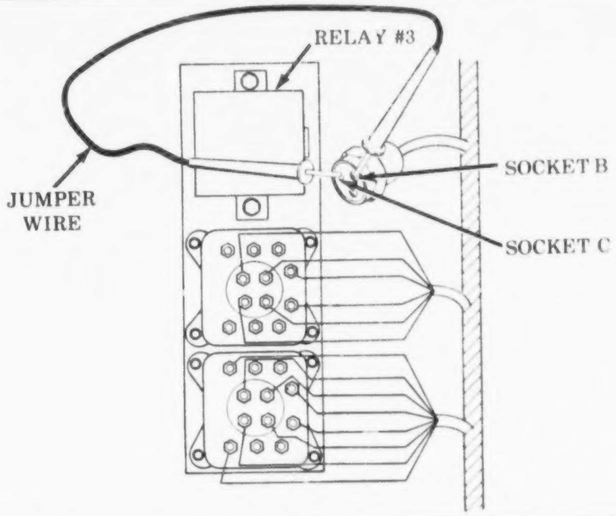
H Connect plug from harness 12351461 to ventilation blower motor. Disconnect harness 12351461 plug (circuits 159A, 159B, 159C) from accessory control box. Press ventilation blower toggle switch to intake position. Check continuity between circuits B and C of accessory control box connector. Press ventilation blower toggle switch to exhaust position and check continuity between circuits A and B of accessory control box connector. If continuity is not indicated in one or both circuits, replace ventilation blower intake and exhaust toggle switch on accessory control box (p 6-26). If continuity is indicated, go to step I.



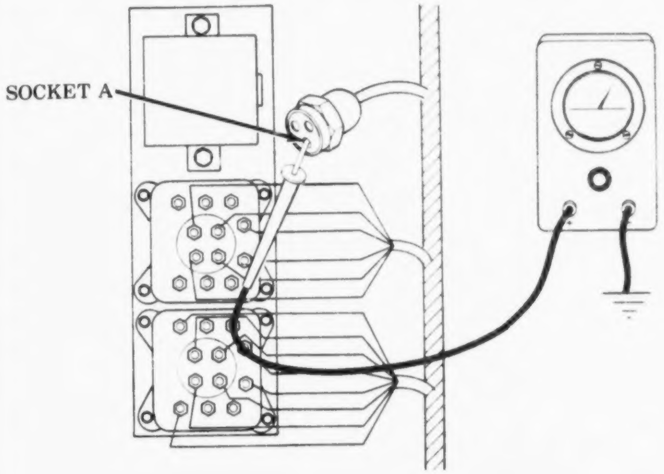
CAUTION

Turn MASTER switch OFF.

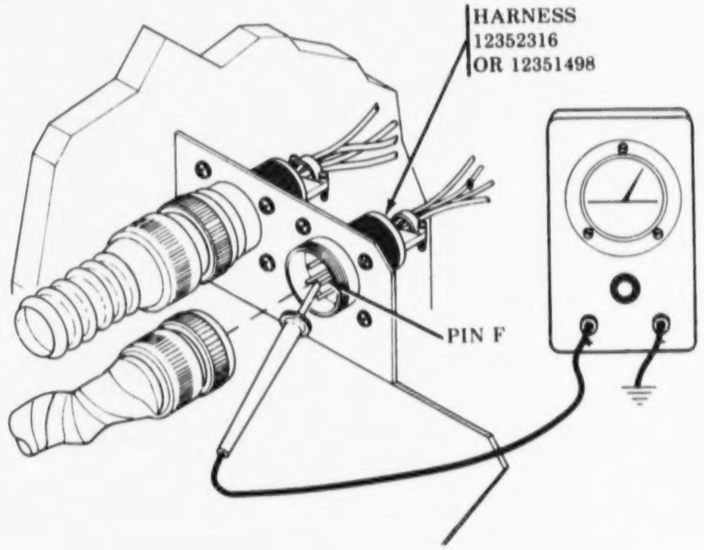
I Connect harness 12351461 plug to accessory control box. Check both AFES relays, no. 1 and no. 2, for continuity between terminals 13 and 14. If continuity is indicated, replace electrical harness 12351461 (p 6-93). If continuity is not indicated, replace defective relay (p 14-36).



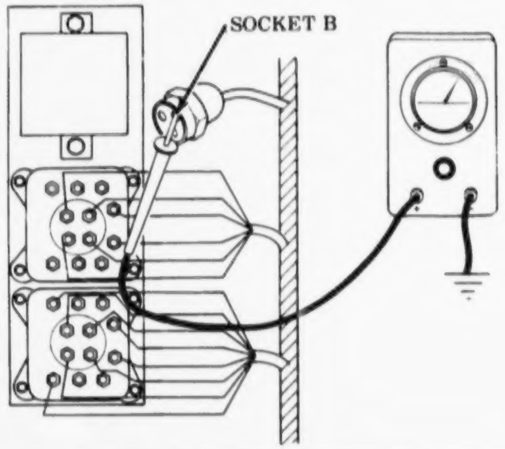
J Turn MASTER switch OFF. Disconnect harness 12351461 from AFES relay no. 3. Place jumper wire between plug sockets B and C. Turn MASTER switch ON. If blower operates go to step K. If blower does not operate go to step M.



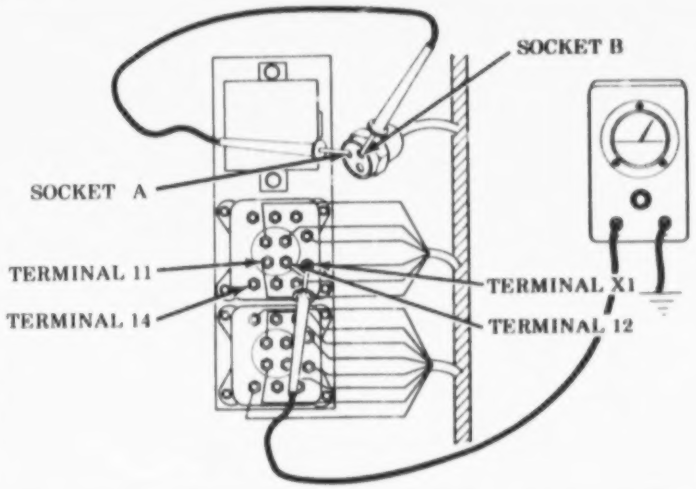
K Turn MASTER switch OFF. Remove jumper wire. Place red probe of multimeter in plug socket A and ground black probe. Check voltage. Do AFES crew fire detection system test (p 14-56 for vehicles 1 thru 344 or p 14-60.1 for vehicles 345 and above). Watch multimeter; after actuating manual discharge switch (step H of crew fire detection test), meter should indicate a pulse voltage of a minimum of 0.5 seconds duration. If voltage is indicated, replace AFES relay no. 3 (p 14-36). If no voltage is indicated, go to step L.



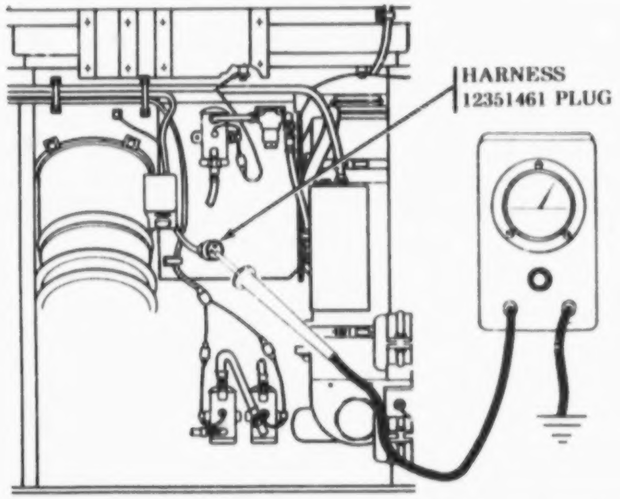
L Turn MASTER switch OFF. Connect harness 12351461 plug to AFES relay no. 3. Disconnect harness 12351461 plug from AFES 12352316 or 12351498 receptacle. Place red probe of multimeter on pin F of AFES harness 12351498 or 12352316 receptacle and ground black probe. Do AFES crew fire detection system test (p 14-56 for vehicles 1 thru 344 or p 14-60.1 for vehicles 345 and above). Watch multimeter; after actuating manual discharge switch (step H of crew fire detection test), meter should indicate a pulse voltage of a minimum of 0.5 seconds duration. If voltage is indicated, replace wiring harness 12351461 (p 6-98). If voltage is not indicated, test continuity of AFES electrical harness 12352316 (p 14-52.4) or 12351498 (p 14-40.2). If AFES harness 12352316 or 12351498 is not defective, replace AFES standard control amplifier (p 14-40).



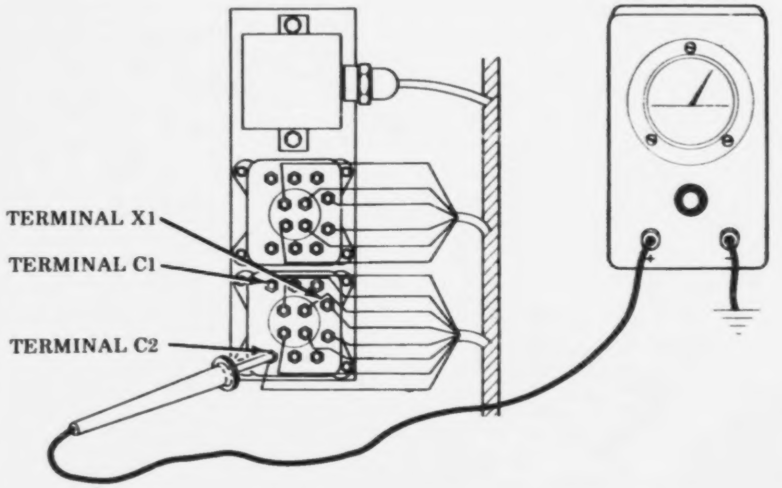
M Turn MASTER switch OFF. Remove jumper wire from harness 12351461 plug sockets B and C. Check voltage. Place red probe of multimeter in socket B of harness 12351461 plug. Ground black probe. Turn MASTER switch ON. If voltage is indicated, go to step N. If voltage is not indicated, go to step S.



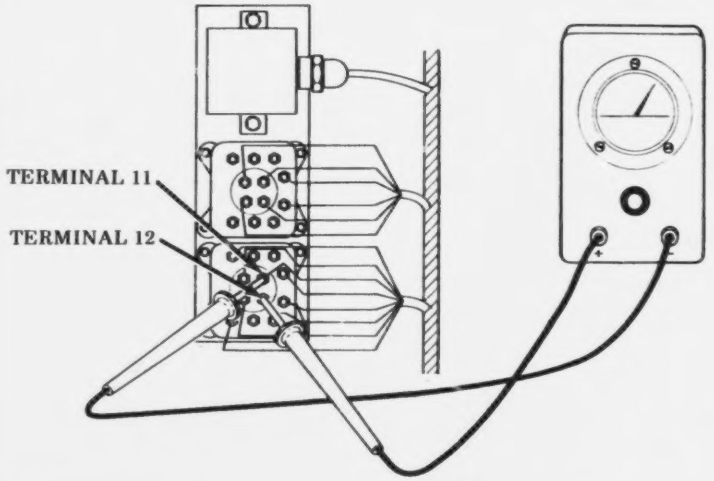
N Turn MASTER switch OFF. Place jumper wire between harness 12351461 plug sockets B and C. Check voltage. Place red probe of multimeter on terminal X1 of AFES relay no. 1. Ground black probe. Turn MASTER switch ON. If voltage is not indicated, replace electrical harness 12351461 (p 6-93). If voltage is indicated check voltage at terminal 12 of relay no. 1. If no voltage is indicated, replace electrical harness 12351461 (p 6-93). If voltage is indicated, check voltage at terminal 11 of relay no. 1. If no voltage is indicated, replace AFES relay no. 1 (p 14-36). If voltage is indicated, go to step O.



O Turn MASTER switch OFF. Remove left projectile rack (p 11-5). Disconnect harness 12351461 plug from ventilation blower motor connector. Check voltage. Place red probe of multimeter in socket A of plug, and ground black probe. Turn MASTER switch ON. If voltage is not indicated, replace electrical harness 12351461 (p 6-93). If voltage is indicated, reconnect electrical harness 12351461 plug to ventilation blower motor connector, and go to step P.



P Turn MASTER switch OFF. Check voltage. Place red probe of multimeter on terminal C2 of AFES relay no. 2. Ground black probe. Turn MASTER switch ON. If no voltage is indicated, replace electrical harness 12351461 (p 6-93). If voltage is indicated, check voltage at terminal X1 of relay no. 2. If voltage is not indicated, replace harness 12351461 (p 6-93). If voltage is indicated, check voltage at terminal C1 of relay no. 2. If voltage is not indicated, replace AFES relay no. 2 (p 14-36). If voltage is indicated, go to step Q.

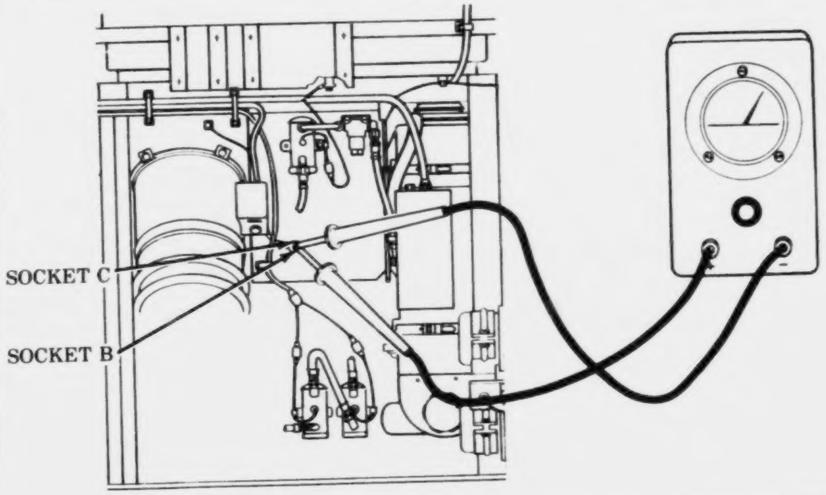


CAUTION

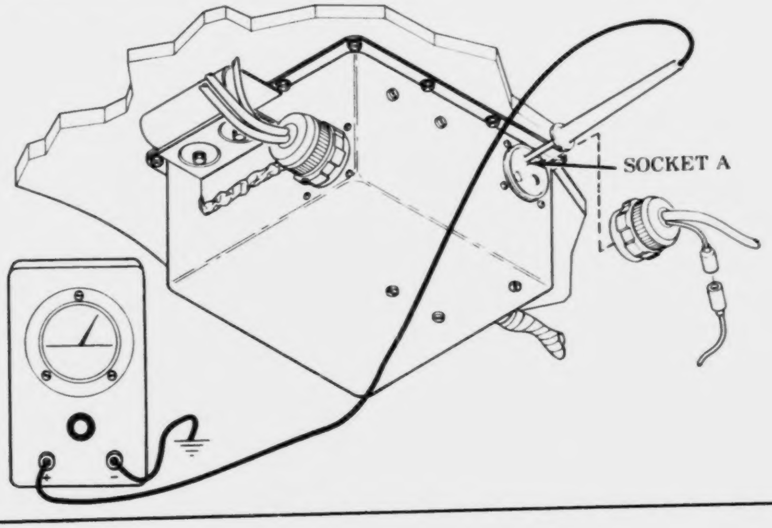
Be careful when doing steps Q and R. Check continuity. Do not touch probes of multimeter to any terminals other than those specified in procedures, or damage to multimeter will occur.

Q Turn MASTER switch OFF. Disconnect wires from terminals 11 and 12 of AFES relay no. 2. Turn MASTER switch ON. Check continuity between terminals 11 and 12 of AFES relay no. 2. If continuity is not indicated, replace AFES relay no. 2 (p 14-36). If continuity is indicated, turn MASTER switch OFF, reconnect wires to terminals 11 and 12 of relay no. 2, and go to step R.

TA310546



R Disconnect harness 12351461 plug from ventilation blower motor connector. Turn MASTER switch ON. Check continuity between plug sockets B and C. If continuity is not indicated, replace electrical harness 12351461 (p 6-93).



S Turn MASTER switch OFF. Disconnect harness 12351461 plug (circuits 159, 48, 159) from accessory control box. Check voltage. Place red probe of multimeter in socket A of accessory control box connector, and ground black probe. Turn MASTER switch ON. If voltage is not indicated, troubleshoot accessory control box circuitry (p 6-26). If voltage is indicated, replace electrical harness 12351461 (p 6-93).

TA310547

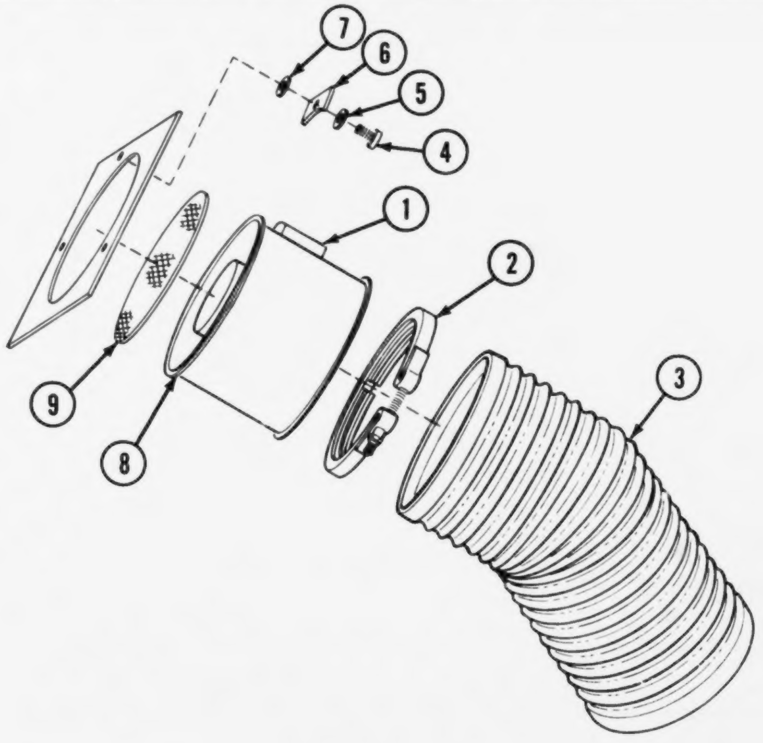
PERSONNEL VENTILATION BLOWER	**AIR CIRCULATION ISN'T SUFFICIENT**

START HERE

1 Clean air intake screen.

2 Replace blower (p 14-63).

PERSONNEL AIR VENTILATING SYSTEM: REMOVAL AND INSTALLATION



REMOVAL

A Turn MASTER switch OFF.

B Disconnect electrical plug at receptacle (1).

C Remove clamp (2) and elbow (3).

D Remove three screws (4), six flat washers (5), plates (6) and flat washers (7).

E Remove fan assembly (8) and screen (9).

NOTE

Clean screen with dry-cleaning solvent (item 19, Appx D), or water and nonsudsing detergent.

INSTALLATION

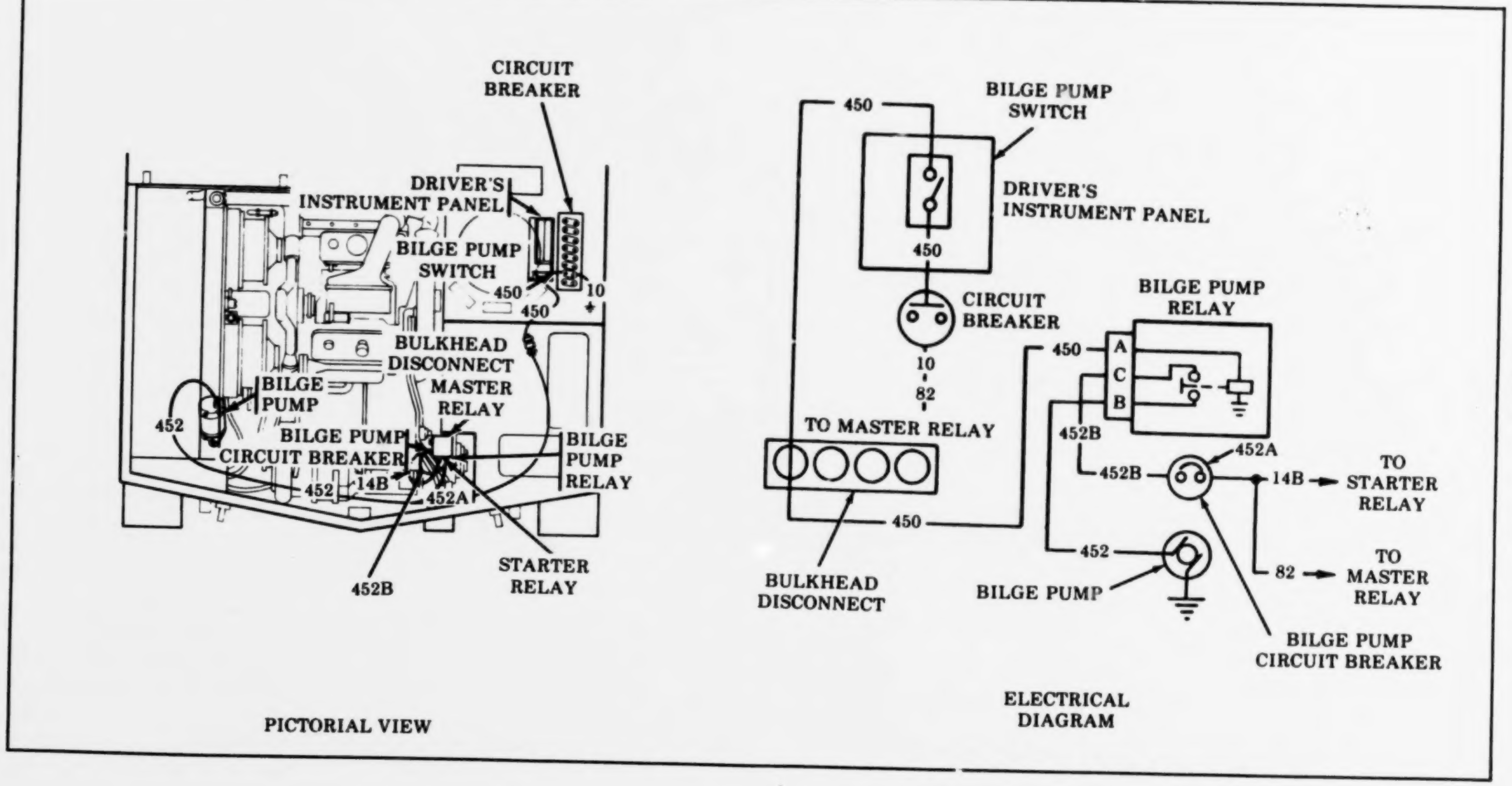
Reverse removal procedures.

TA310548

BILGE PUMP	**BILGE PUMP DOESN'T OPERATE**

START HERE Troubleshoot bilge pump circuit.

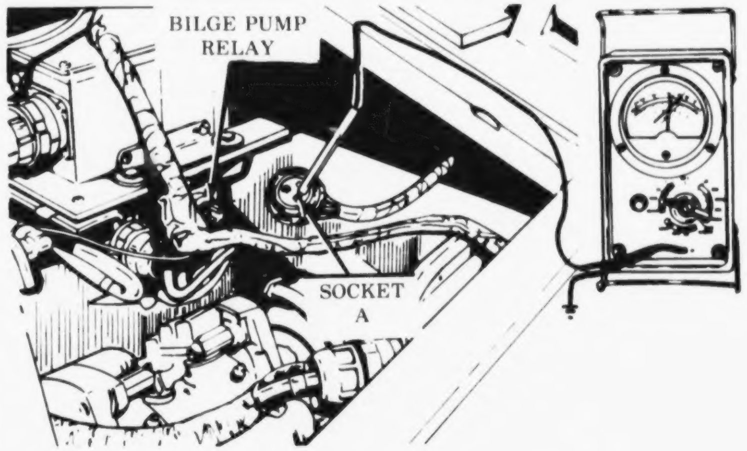
BILGE PUMP CIRCUIT


CIRCUIT BREAKER
DRIVER'S INSTRUMENT PANEL
BILGE PUMP SWITCH
450
450
10
BULKHEAD DISCONNECT
MASTER RELAY
BILGE PUMP
452
BILGE PUMP CIRCUIT BREAKER
BILGE PUMP RELAY
452
14B
452A
452B
STARTER RELAY
450
BILGE PUMP SWITCH
DRIVER'S INSTRUMENT PANEL
450
CIRCUIT BREAKER
10
82
TO MASTER RELAY
BILGE PUMP RELAY
450
A
C
B
452B
452A
452B
14B
TO STARTER RELAY
450
452
82
TO MASTER RELAY
BULKHEAD DISCONNECT
BILGE PUMP
BILGE PUMP CIRCUIT BREAKER

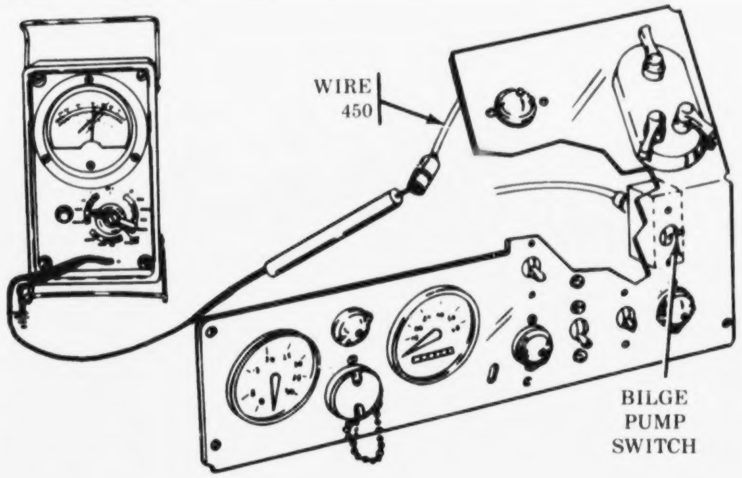
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA57371

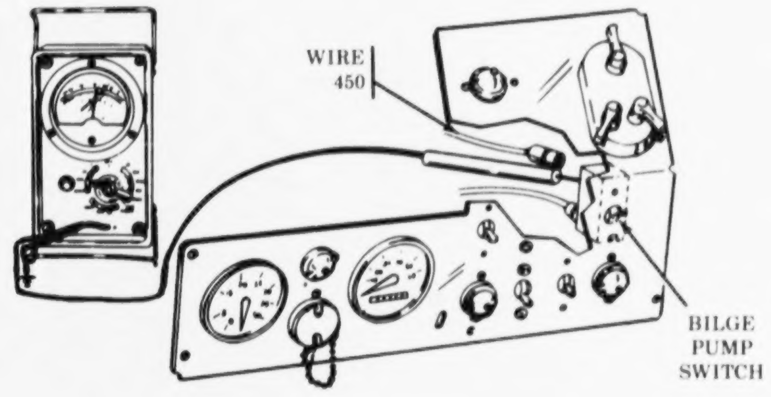


A Disconnect connector at bilge pump relay. Turn MASTER switch and BILGE PUMP switch ON. Place red multimeter lead in socket A and black lead to ground. Check for voltage. If no voltage, go to step B. If voltage is present, go to step F.

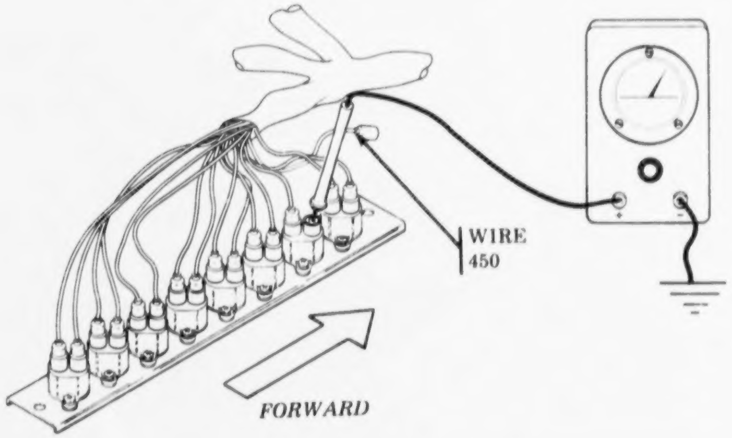


B Disconnect wire 450 at BILGE PUMP switch output. Turn BILGE PUMP switch ON. Place red multimeter lead in switch output, ground black lead and check for voltage at switch output. If voltage is present, repair or replace wire 450 (p 6-21) (Appx F). If no voltage, go to step C.

TA310550

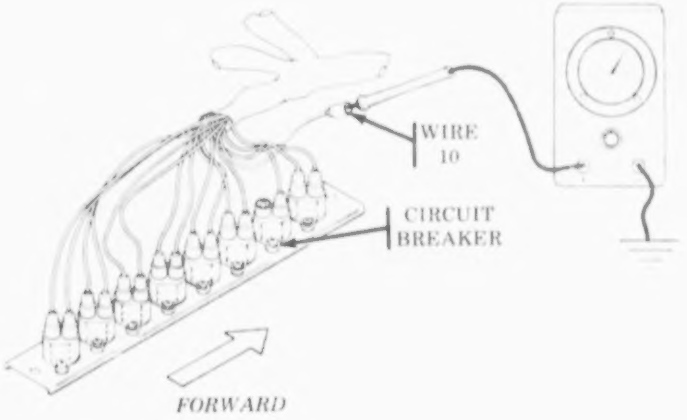


C Disconnect wire 450 from BILGE PUMP switch input. Using multimeter, place red lead on wire 450 and black lead to ground. If voltage is present, replace BILGE PUMP switch (p 6-21). If no voltage, go to step D.

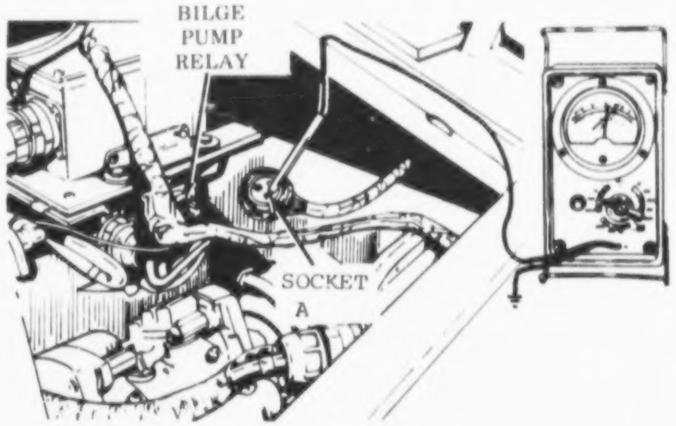


D Disconnect wire 450 at circuit breaker output. Using multimeter, place red lead in circuit breaker output. Ground black lead. If voltage is present, repair or replace wire 450 (p 6-21 and Appx F). If no voltage, go to step E.

TA310551

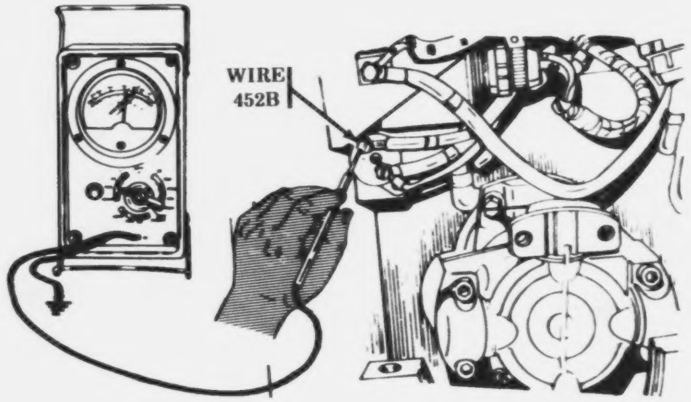

WIRE 10
CIRCUIT BREAKER
FORWARD

E Disconnect wire 10 from circuit breaker input. Using multimeter, place red lead in wire 10. Ground black lead. If voltage is present, replace circuit breaker (p 6-54). If no voltage, repair or replace wire 10 (p 6-77).

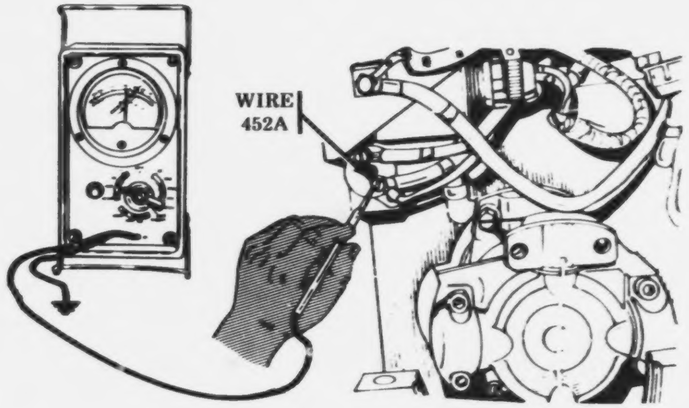

BILGE PUMP RELAY
SOCKET A

F With bilge pump relay connector disconnected, place red multimeter lead in socket C (wire 452B), and black lead to ground. If no voltage, go to step G. If voltage is present, go to step I.

TA310552

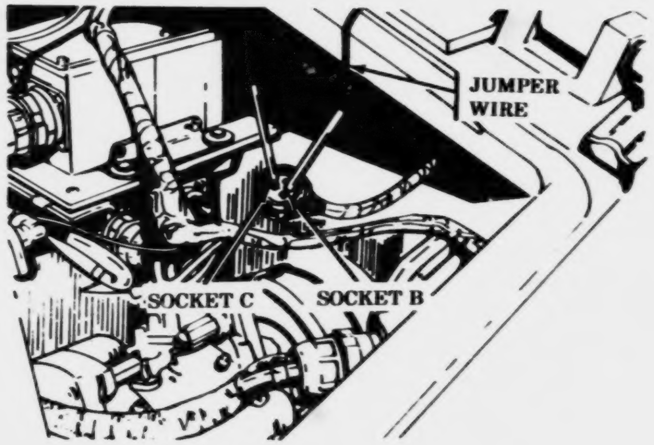


G Place red multimeter lead on bilge pump circuit breaker output (wire 452B) and ground black lead. If voltage is present, repair or replace wire 452B (p 6-72). If no voltage, go to step H.

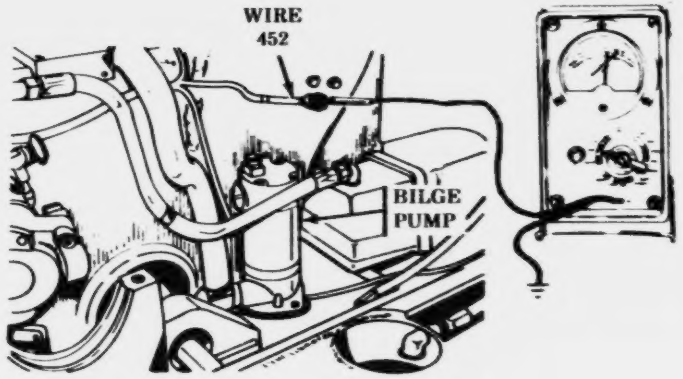


H Place red multimeter lead on bilge pump circuit breaker input (wire 452A) and ground black lead. If voltage is present, replace circuit breaker (p 6-46). If no voltage, repair or replace wire 452A (Appx F).

TA310553


JUMPER WIRE
SOCKET C
SOCKET B

I Use jumper wire to connect socket C (wire 152B) to socket B (wire 452). If bilge pump operates, replace bilge pump relay (p 6-46). If bilge pump fails to operate, go to step J.


WIRE 452
BILGE PUMP

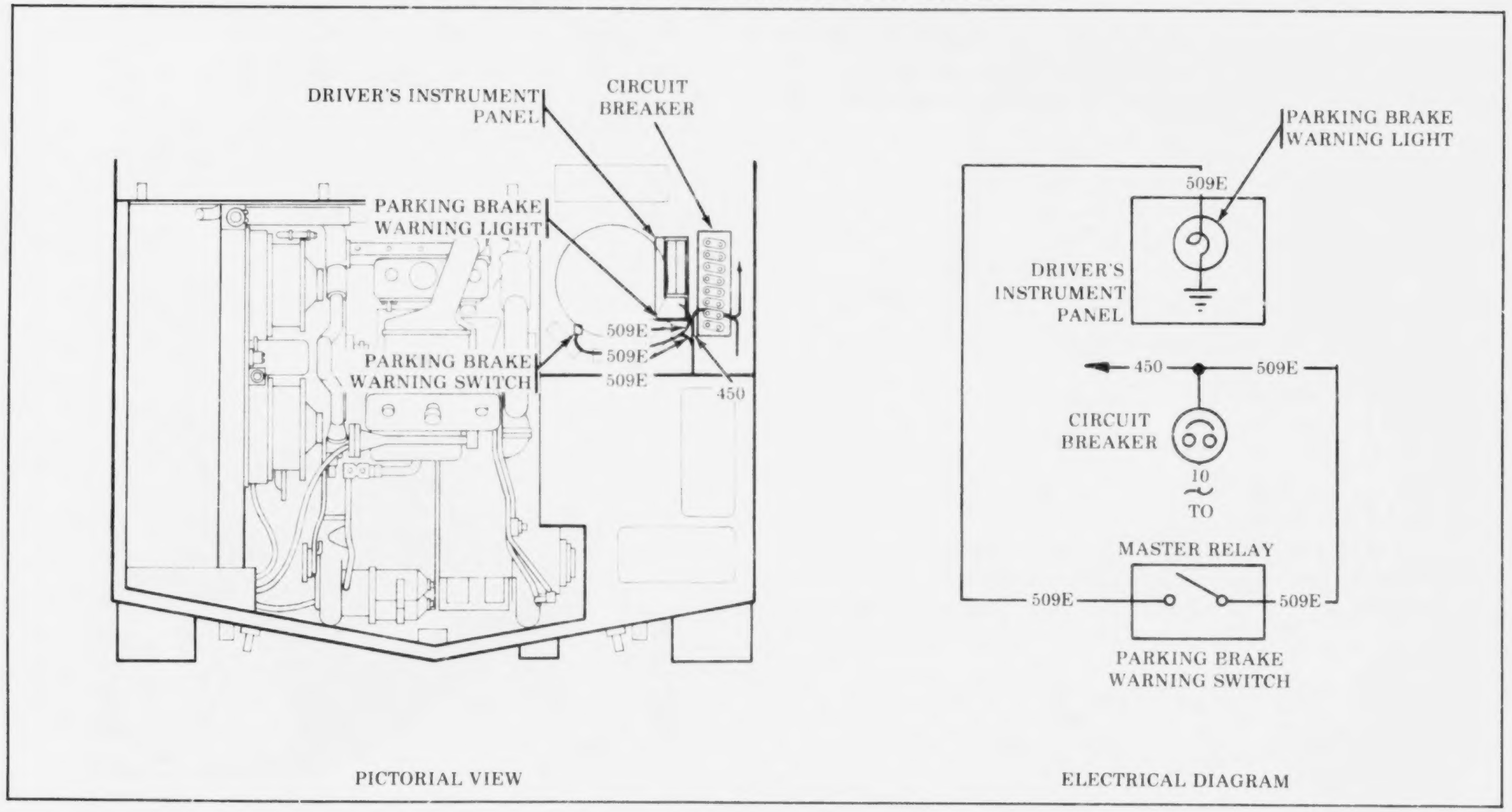
J With jumper wire connected to socket C and socket B, disconnect wire 452 at bilge pump. Place red multimeter lead in wire 452 and ground black lead. If voltage is present, replace bilge pump (p 14-74). If no voltage, repair or replace wire 452 (p 6-72).

TA310554

PARKING BRAKE	PARKING BRAKE WARNING LIGHT IS OUT

START HERE Troubleshoot parking brake warning light circuit.

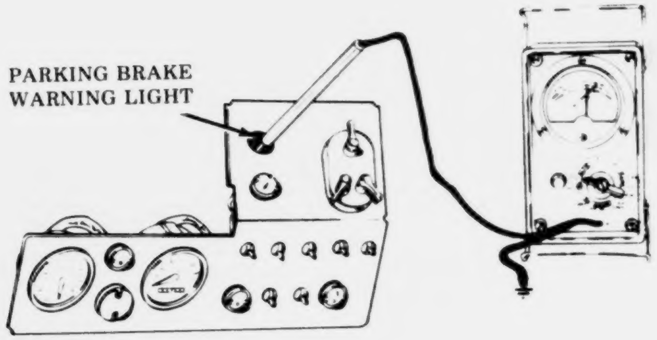
PARKING BRAKE WARNING LIGHT CIRCUIT


DRIVER'S INSTRUMENT PANEL
CIRCUIT BREAKER
PARKING BRAKE WARNING LIGHT
PARKING BRAKE WARNING SWITCH
509E
509E
509E
450
PARKING BRAKE WARNING LIGHT
509E
DRIVER'S INSTRUMENT PANEL
450
509E
CIRCUIT BREAKER
10
TO
MASTER RELAY
509E
509E
PARKING BRAKE WARNING SWITCH

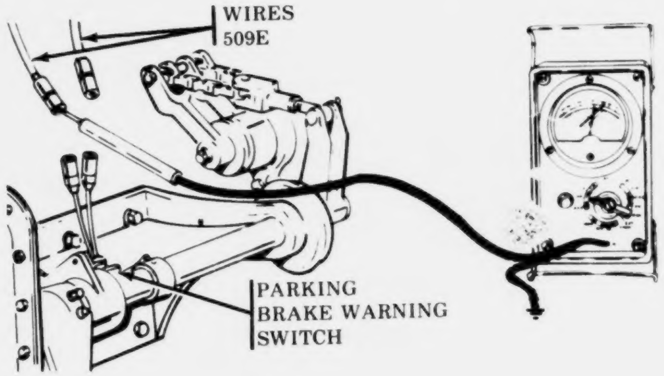
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310555

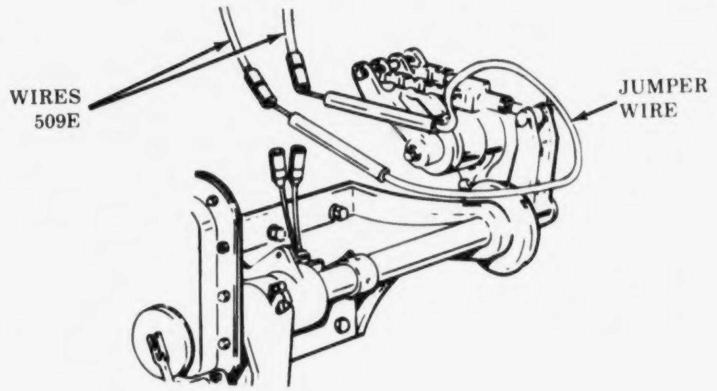

PARKING BRAKE
WARNING LIGHT

A Remove bulb from parking brake warning light (p 6-21). With MASTER switch ON and brakes applied, check voltage by placing red multimeter lead in center contact and ground black lead. If voltage is present, replace bulb. If no voltage, go to step B.


WIRES
509E
PARKING
BRAKE WARNING
SWITCH

B Disconnect both 509E wires from parking brake warning switch. Place red multimeter lead in either wire 509E, ground black lead and check for voltage. Repeat for second wire 509E. If no voltage on either wire, repair or replace wire 509E (p 6-84). If voltage is present, go to step C.

TA310556



C Using jumper, connect wires 509E together. If parking brake warning light comes on, adjust or replace parking brake warning switch (p 7-19). If parking brake warning light fails to light, repair or replace wire 509E from switch to parking brake warning light (p 6-84).

TA310557

ELECTRICAL FUEL PUMP	**ENGINE MISSES WHEN LOW ON FUEL**

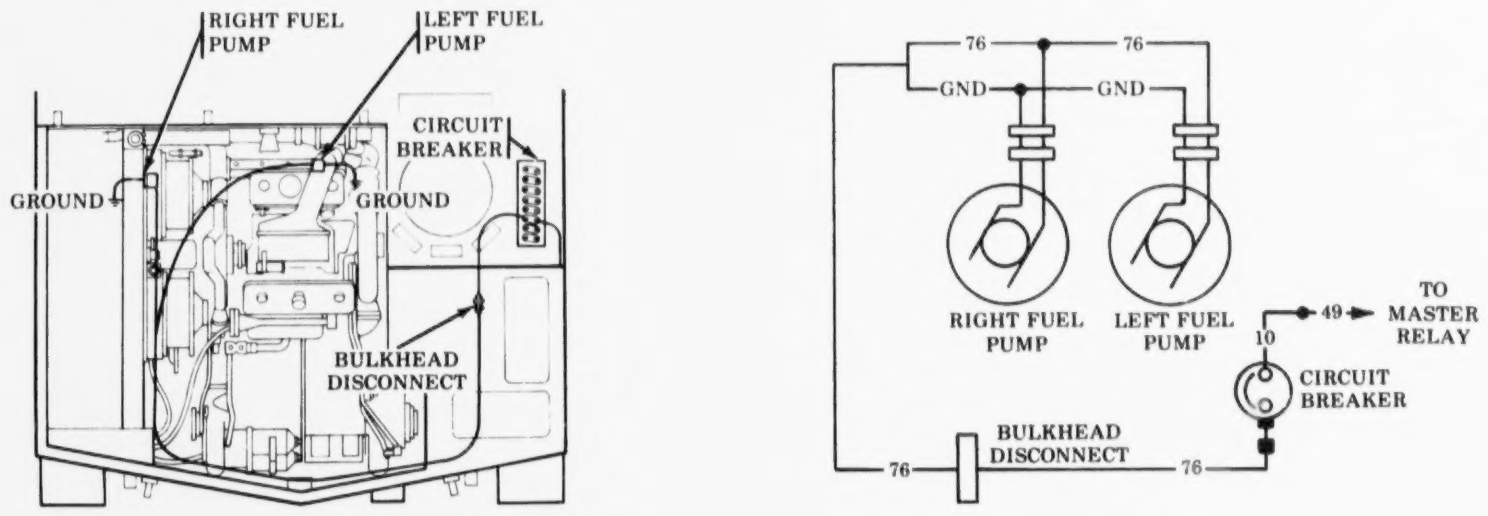
START HERE

Troubleshoot electric tuel pump circuit.

NOTE

Left fuel pump can be tested from driver's access door. Powerpack must be removed to test right fuel pump.

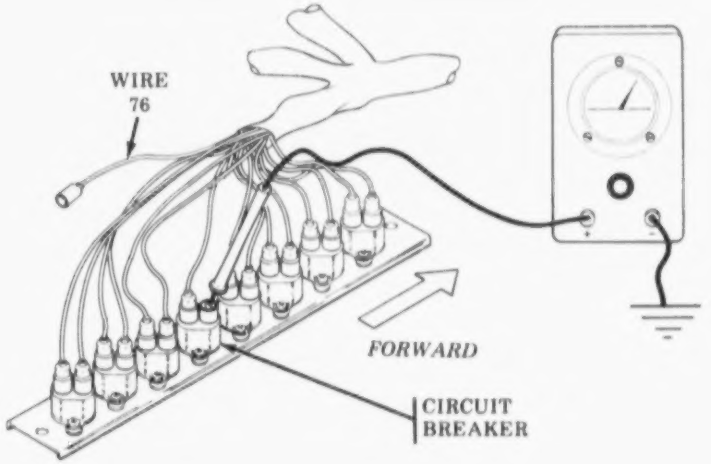
ELECTRIC FUEL PUMP CIRCUIT


RIGHT FUEL PUMP
LEFT FUEL PUMP
CIRCUIT BREAKER
GROUND
GROUND
BULKHEAD DISCONNECT
76
76
GND
GND
RIGHT FUEL PUMP
LEFT FUEL PUMP
49
TO MASTER RELAY
10
CIRCUIT BREAKER
BULKHEAD DISCONNECT
76
76

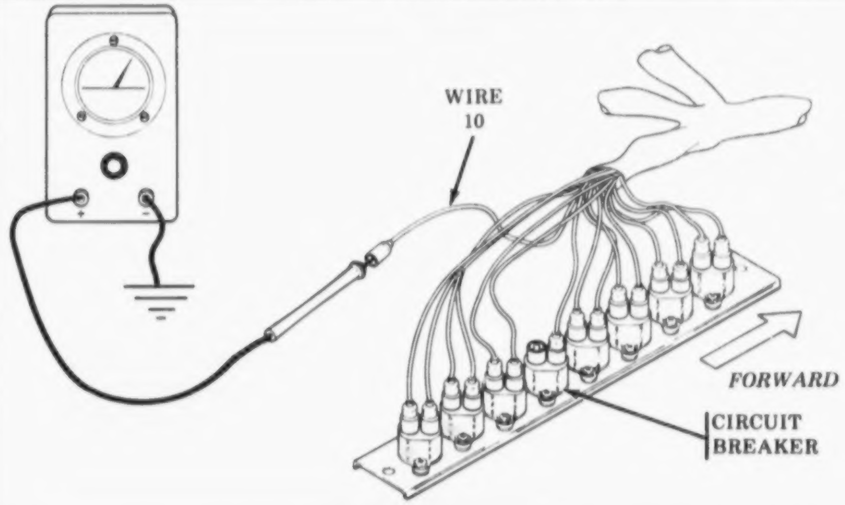
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310558

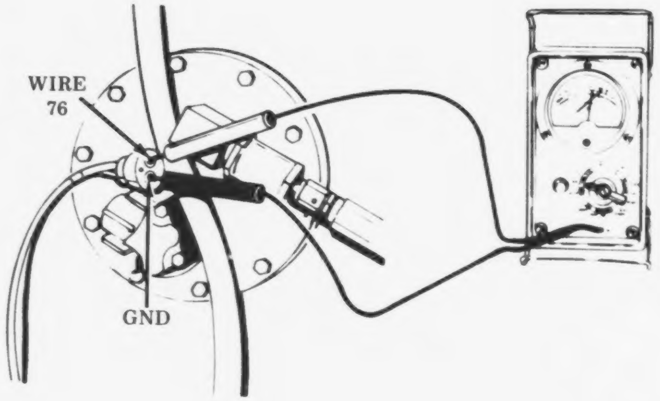

WIRE
76
FORWARD
CIRCUIT
BREAKER

A Disconnect wire 76 from circuit breaker. Turn MASTER switch ON. Using multimeter set to dc volts scale, place red lead in circuit breaker output and ground black lead. If no voltage, go to step B. If voltage is present, go to step C.


WIRE
10
FORWARD
CIRCUIT
BREAKER

B Disconnect wire 10 from circuit breaker. Place red multimeter lead in wire 10 and ground black lead. If voltage is present, replace circuit breaker (p 6-54). If no voltage, repair or replace wire 10 (p 6-93).

TA310559



NOTE

To trace circuit 76, check harness 10921380 (p 6-72). If cargo compartment main wiring harness is defective, notify Support Maintenance.

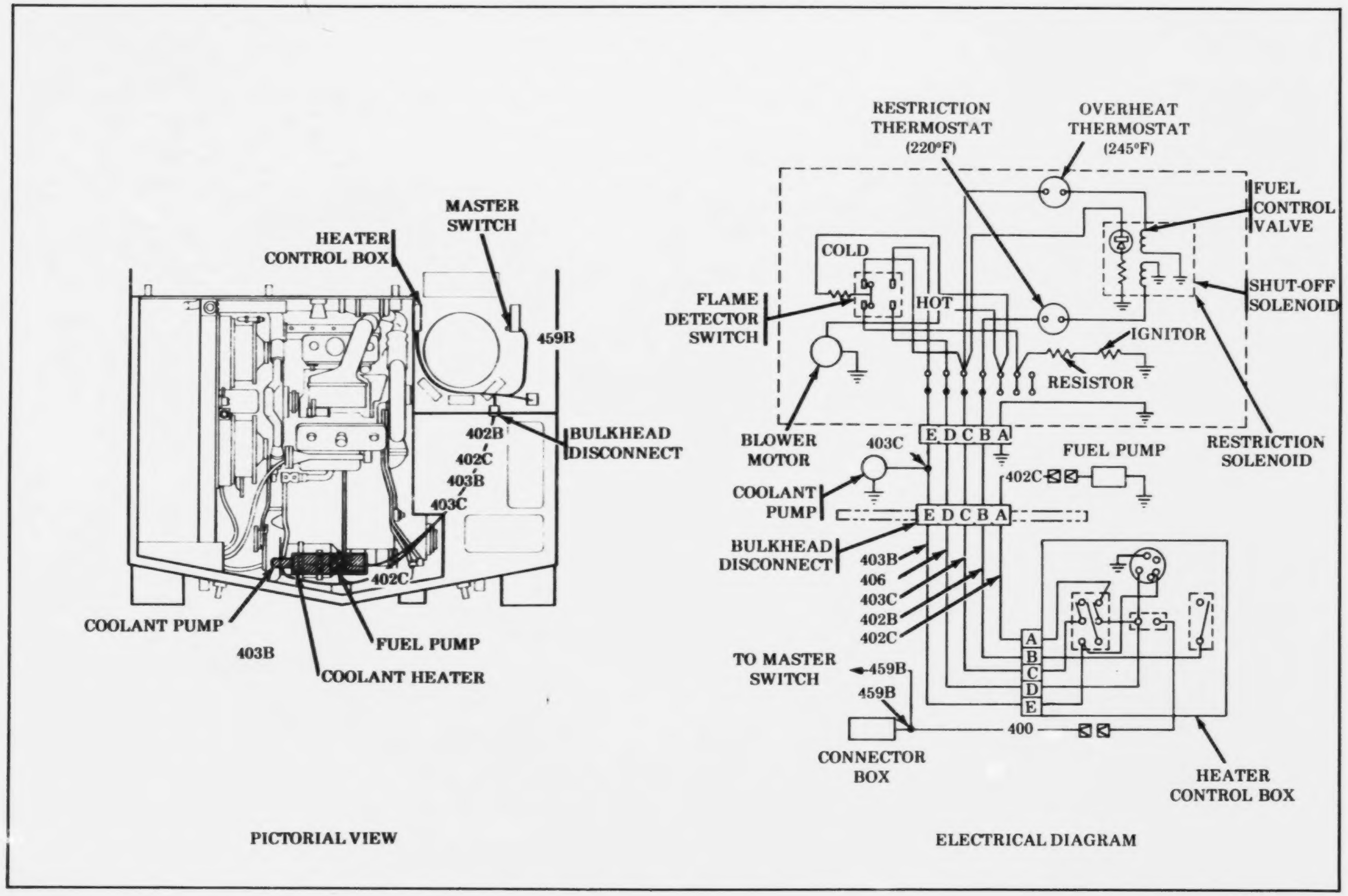
C Disconnect wire 76 from fuel pumps. Using multimeter place red lead in wire 76 and ground black lead. If no voltage, repair or replace wire 76. If voltage is present, replace inoperative fuel pump (p 4-10).

WINTERIZATION KIT	**COOLANT HEATER DOESN'T OPERATE** Do steps A through D. **HEATER BLOWER OPERATES, BUT MOTOR DOESN'T OPERATE** Do steps E and F. **HEATER MOTOR OVERHEATS** Do step G.

START HERE → Troubleshoot winterization kit circuit.

TA310560

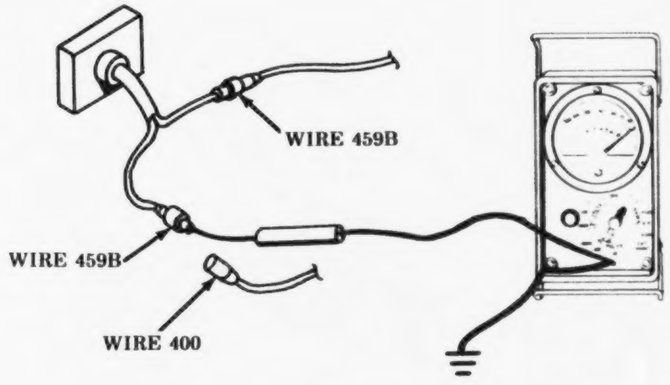
WINTERIZATION KIT CIRCUIT


MASTER SWITCH
HEATER CONTROL BOX
459B
BULKHEAD DISCONNECT
402B
402C
403B
403C
402C
COOLANT PUMP
403B
FUEL PUMP
COOLANT HEATER
RESTRICTION THERMOSTAT (220°F)
OVERHEAT THERMOSTAT (245°F)
FUEL CONTROL VALVE
SHUT-OFF SOLENOID
COLD
HOT
FLAME DETECTOR SWITCH
IGNITOR
RESISTOR
BLOWER MOTOR
RESTRICTION SOLENOID
E D C B A
403C
FUEL PUMP
402C
COOLANT PUMP
E D C B A
BULKHEAD DISCONNECT
403B
406
403C
402B
402C
TO MASTER SWITCH
459B
459B
A
B
C
D
E
400
CONNECTOR BOX
HEATER CONTROL BOX

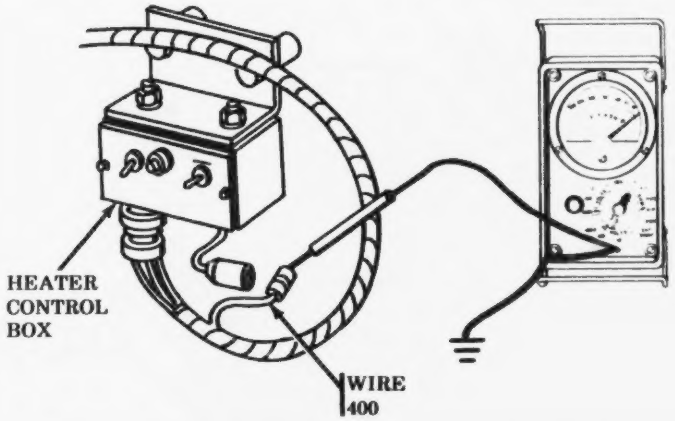
PICTORIAL VIEW

ELECTRICAL DIAGRAM

TA310561

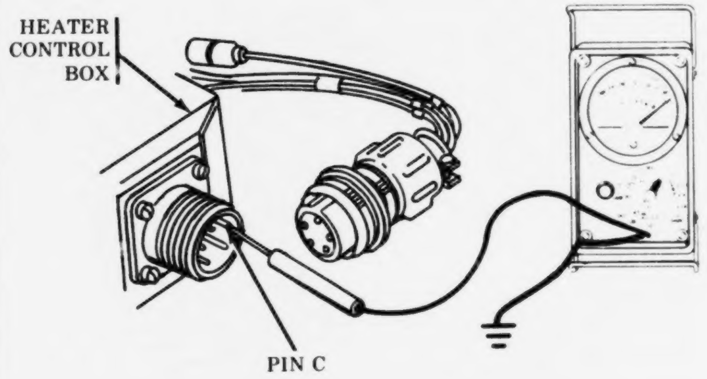


A Disconnect wire 459B from wire 400. Place red lead of multimeter in wire 459B connector and black lead to ground. Place MASTER switch ON. Check for voltage. If no voltage, troubleshoot master relay circuit (p 2-63). If voltage is present, go to step B.

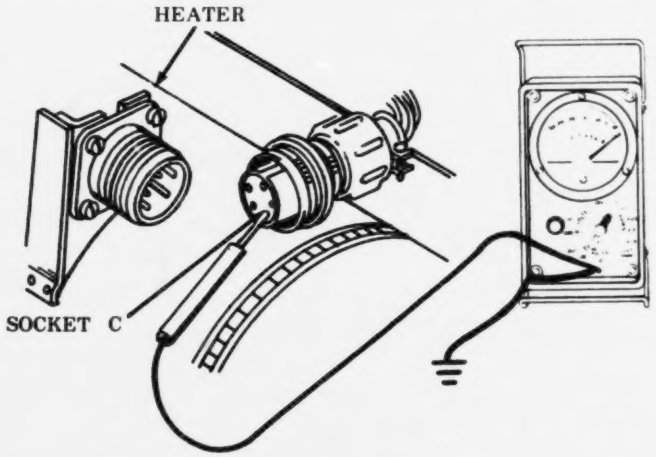


B Disconnect wire 400 from heater control box. Place red multimeter lead in wire 400 and ground black lead. Turn MASTER switch ON. If no voltage, repair or replace wire 400 (p 15-2 and p 15-11). If voltage is present, reconnect wire 400 and go to step C.

TA310562

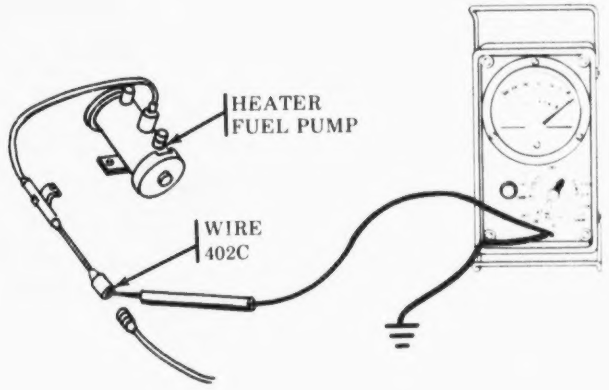


C Disconnect connector from heater control box. Turn MASTER switch ON. Place red multimeter lead on pin C and ground black lead. Move heater control switch to START position. If no voltage, replace heater control box (p 15-4). If voltage is present, go to step D.

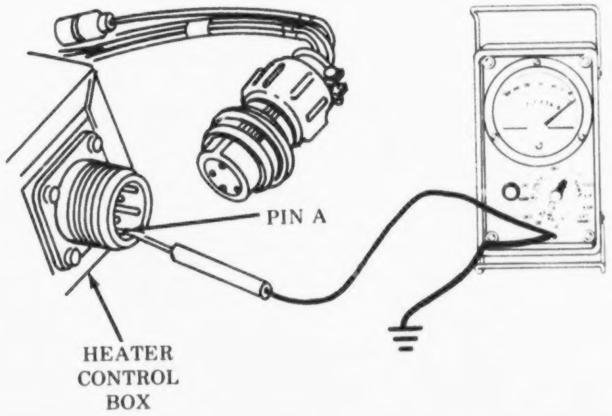


D Reconnect harness at heater control box and disconnect harness at coolant heater. Place red multimeter lead in socket C of harness and ground black lead. Move heater control switch to the START position. If voltage is present, replace heater (p 15-7). If no voltage, repair or replace wire 403C (p 15-2 and 15-11).

TA310563

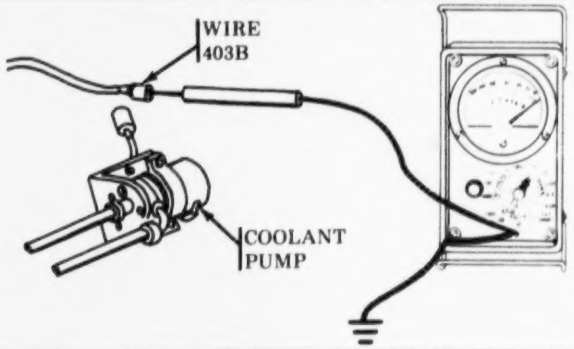


E Disconnect wire 402C at heater fuel pump. Place red multimeter lead in wire 402C from harness and ground black lead. Move heater control switch to START position and then to LOW position. If voltage is present in both positions, replace fuel pump (p 15-6). If no voltage, go to step F.



F Disconnect harness at heater control box. Place red multimeter lead on pin A of heater control box and ground black lead. Move heater control switch to START position and then to LOW position. If voltage is present in both positions, repair or replace wire 402C (p 15-2 and 15-11). If no voltage in both positions, repair heater control box (p 15-9).

TA310564



G Disconnect wire 403B from coolant pump. Start heater. When heater indicator light comes on, move heater control switch to LOW position. Place red multimeter lead in wire 403B and ground black lead. If no voltage, repair wire 403B (p 15-2 and p 15-11). If voltage is present, replace coolant pump (p 15-5).

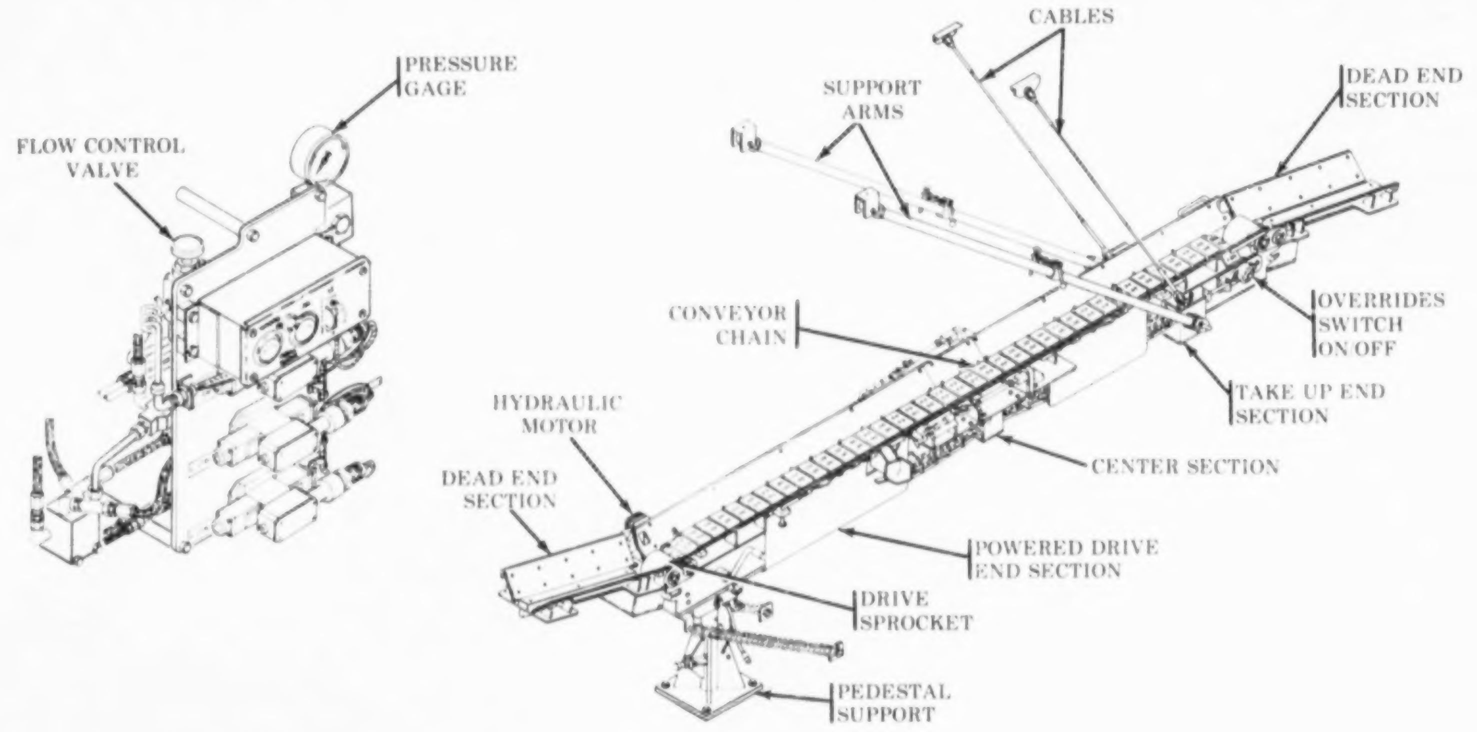
CONVEYOR	**CONVEYOR CHAIN WILL NOT MOVE** Do steps A through H. **CONVEYOR CHAIN IS JAMMED OR BROKEN** Do step I. **CONVEYOR CHAIN CREEPS** Do step J. **CONVEYOR MOVES IN ONE DIRECTION ONLY** Do steps A and F.

START HERE

WARNING

Test components must be capable of withstanding a working pressure of 2000 psi. Also, never tighten hydraulic lines or fittings while hydraulic system is pressurized. Damage to tubes and fittings could result in personnel injury.

TA310565


PRESSURE GAGE
FLOW CONTROL VALVE
CABLES
SUPPORT ARMS
DEAD END SECTION
CONVEYOR CHAIN
OVERRIDES SWITCH ON/OFF
HYDRAULIC MOTOR
TAKE UP END SECTION
CENTER SECTION
DEAD END SECTION
POWERED DRIVE END SECTION
DRIVE SPROCKET
PEDESTAL SUPPORT

Vehicle MASTER switch is in ON position.

APU operating primary hydraulic system and hydraulic system selector valve is pushed IN (TM 9-2350-267-10).

OR

Main engine operating backup hydraulic system and hydraulic system selector valve is pulled OUT (TM 9-2350-367-10).

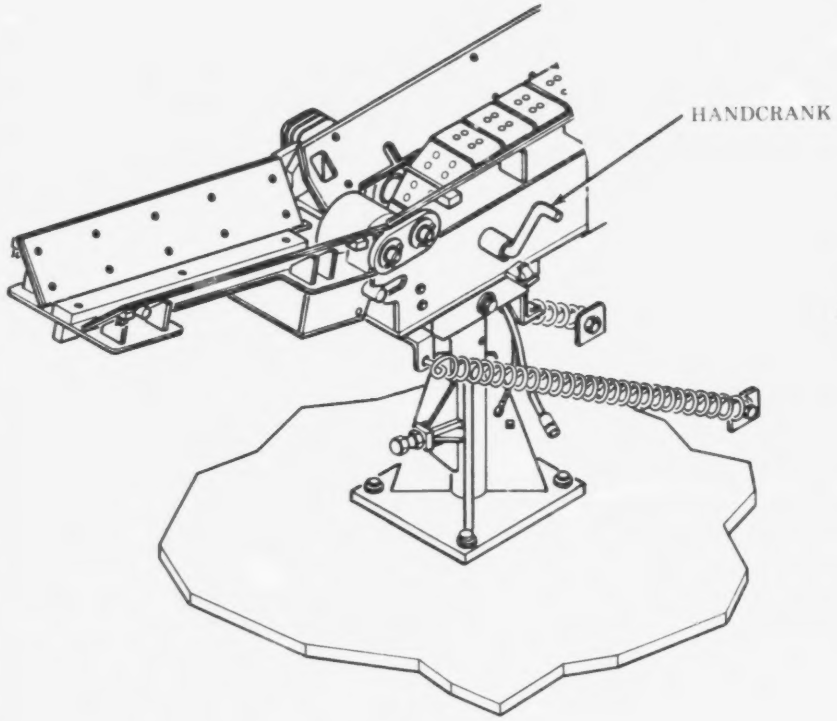
Check hydraulic panel pressure gage. Gage should indicate 100-300 psi. If not, troubleshoot hydraulic system (p 2-242).

Fully deploy conveyor (TM 9-2350-267-10).

Conveyor override safety switch in ON position.

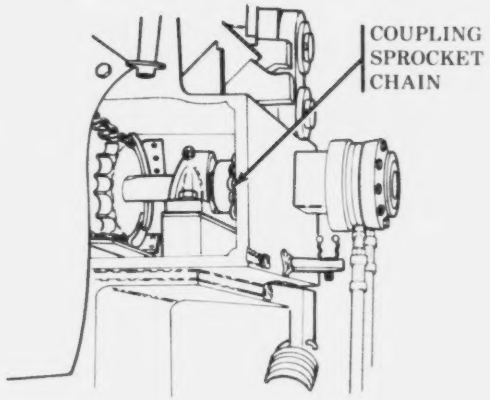
Check flow control valve. Open if closed and adjust conveyor speed.

TA310566

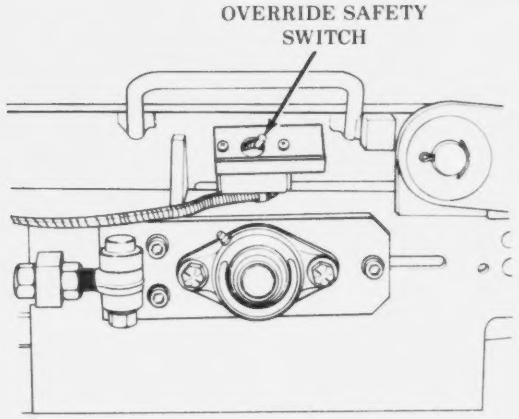


A Shut down hydraulic system, insert handcrank in conveyor manually. If conveyor chain moves easily one full cycle in both directions, go to step B. If conveyor chain does not move (binds or jams), go to step K.

TA310567

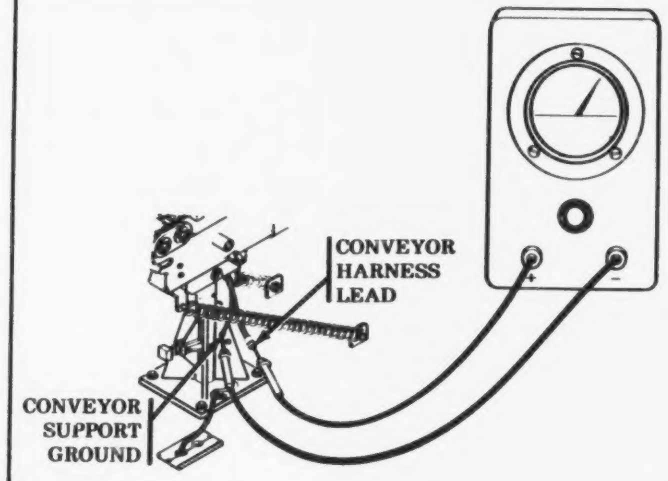

COUPLING
SPROCKET
CHAIN

B Check sprocket coupling chain and repair or replace if broken or damaged (p 12-7). If chain is not broken or damaged, go to step C.

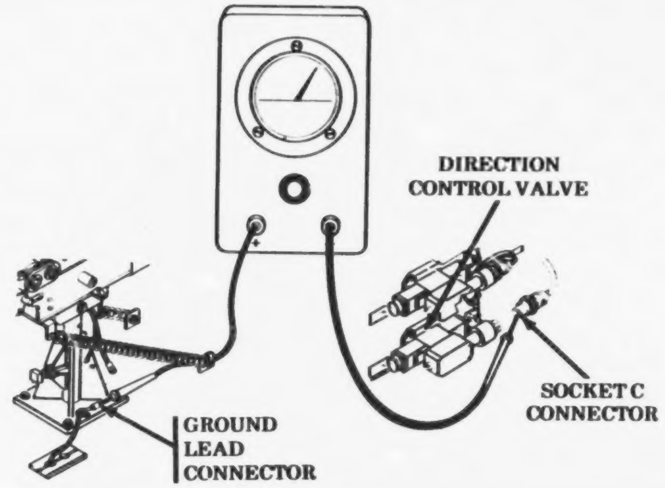

OVERRIDE SAFETY
SWITCH

C Shut down hydraulic system. Set MASTER switch to OFF. Disconnect ground leads from conveyor override switch. Using multimeter, check switch continuity. If switch is defective, replace switch (p 6-63). If switch is not defective, go to step D. Connect ground leads to override switch.

TA310568

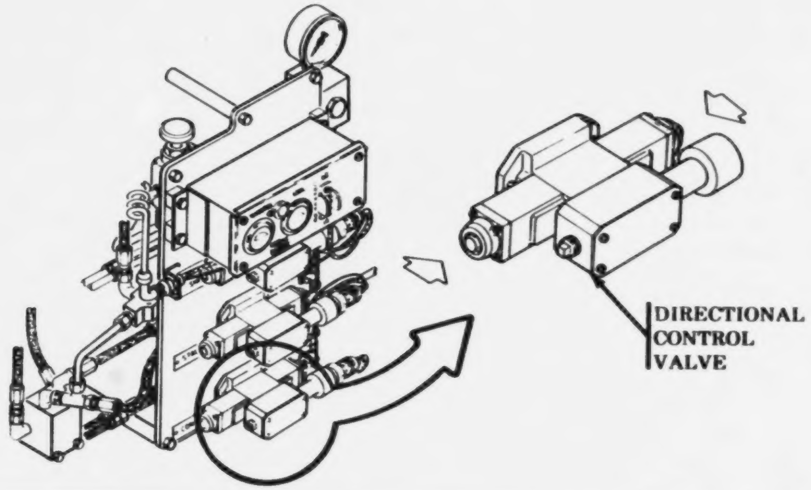

CONVEYOR
HARNESS
LEAD
CONVEYOR
SUPPORT
GROUND
+
−

D Disconnect conveyor harness. Test continuity between conveyor harness lead and conveyor support ground. If harness is defective, repair or replace conveyor harness (p 6-121). If harness is not defective, go to step E.

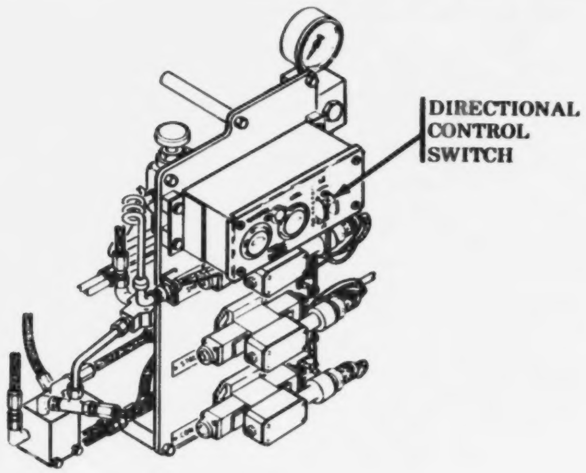

DIRECTION
CONTROL VALVE
SOCKET C
CONNECTOR
GROUND
LEAD
CONNECTOR
+

E Disconnect harness connector at conveyor direction control valve. Test continuity between pin C connector and ground lead connector. If lead is defective, notify Support Maintenance. If lead is not defective, go to step F. Connect harness connector at conveyor direction control valve and connect connector at conveyor support.

TA310569

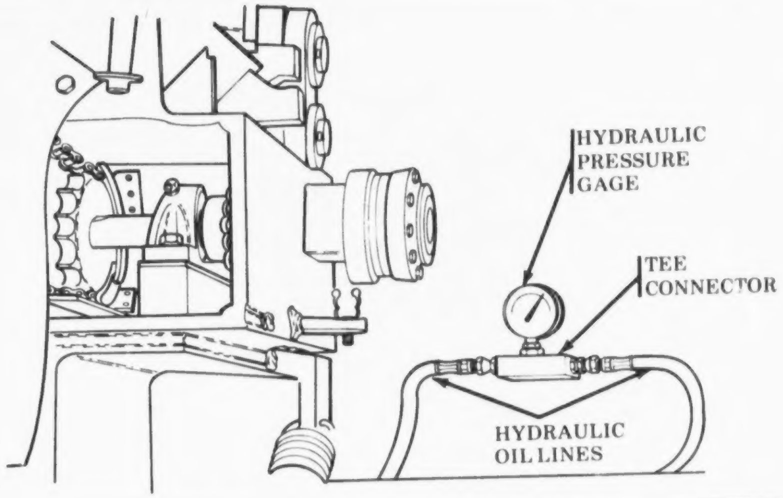


F Set MASTER switch ON. Turn on primary hydraulic system. Operate hydraulic control panel conveyor direction control valve manually in both directions. If valve does not function properly, replace direction control valve (p 16-8). If valve operates properly, go to step G.

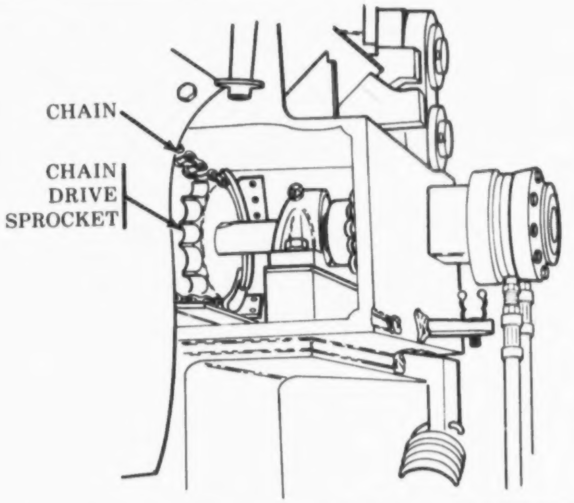


G Operate direction control valve by activating direction control switch. If switch fails to activate direction control valve, troubleshoot electrical system step K. If direction control valve functions properly, go to step H.

TA310570

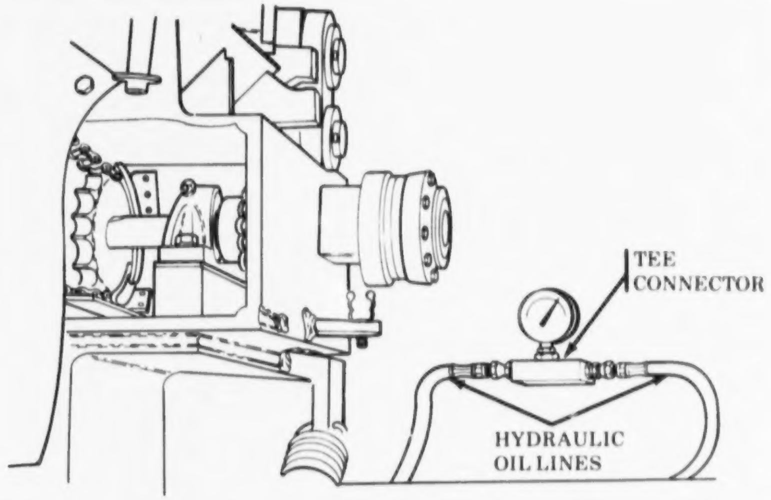

HYDRAULIC PRESSURE GAGE
TEE CONNECTOR
HYDRAULIC OIL LINES

H Shut down hydraulic system. Disconnect hydraulic oil lines from conveyor motor. Install tee connector and hydraulic pressure gage between oil lines. Turn on hydraulic system. Operate conveyor system in both directions. Line pressure should be indicated in both directions. If not, repair or replace oil line from motor to hydraulic control panel (p 16-36). If pressure is indicated in both directions, replace conveyor hydraulic motor (p 12-29).

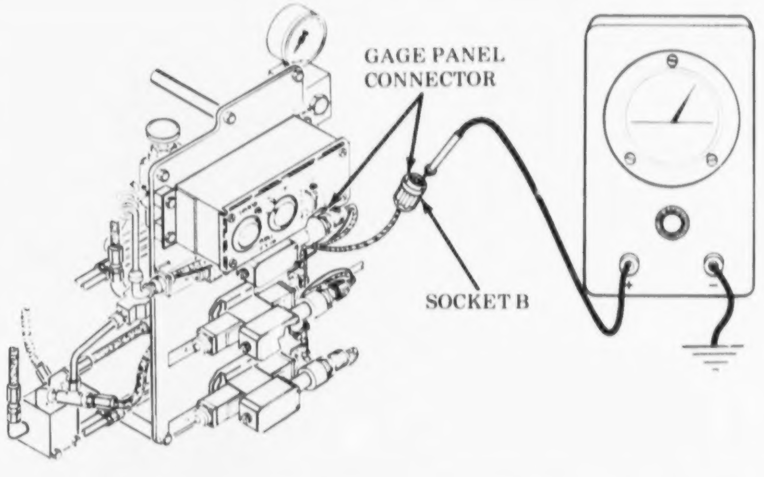

CHAIN
CHAIN DRIVE SPROCKET

I Check conveyor chain and sprocket alinement. Check chain for binding, breakage or other damage. Inspect chain path for obstructions. Check chain drive sprocket for missing, worn or bent teeth. Replace or repair as required (p 12-7).

TA310571

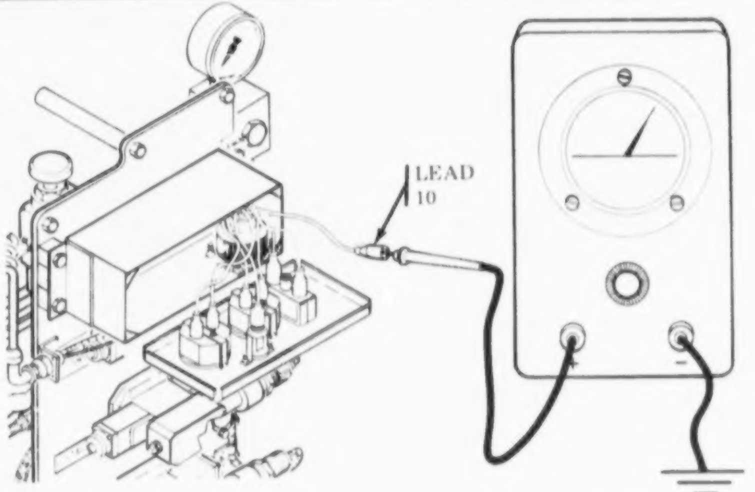


J Shut down hydraulic system. Disconnect hydraulic oil lines from conveyor motor. Install tee connector and pressure gage between oil lines. Turn on hydraulic system. Set CONVEYOR to OFF position. Pressure indicator should show 0 psi. If pressure is indicated, replace conveyor directional control valve (p 16-8).

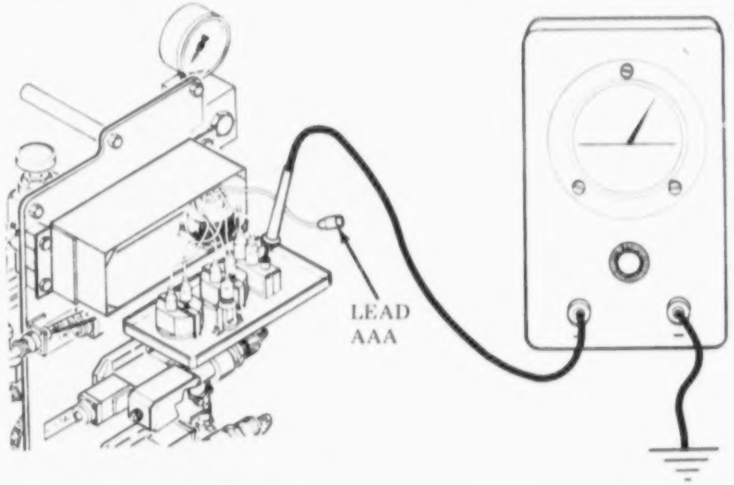


K Turn MASTER switch OFF. Disconnect hydraulic gage panel connector. Use multimeter to check voltage. Place multimeter red probe in socket B. Ground black probe. Turn MASTER switch ON. If multimeter indicates voltage, go to step L. If no voltage is indicated, lead 10 to gage panel connector is defective. Notify Support Maintenance. Set MASTER switch OFF. Connect gage panel connector.

TA310572

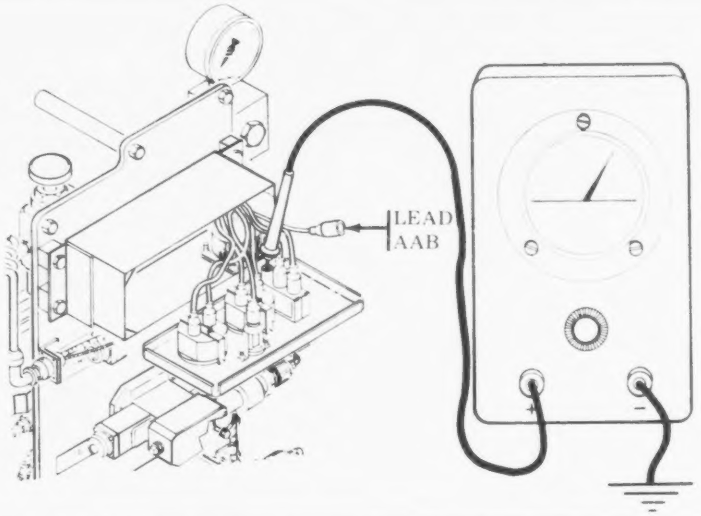


L Disassemble gage panel (p 6-125). Disconnect lead 10 from CONVEYOR control switch. Place multimeter red probe in lead 10. Ground black probe. Set MASTER switch ON. If multimeter indicates voltage, go to step M. If no voltage is indicated, repair lead 10 between CONVEYOR control switch and gage panel connector (p 6-125). Set MASTER switch OFF and connect lead 10 CONVEYOR control switch.

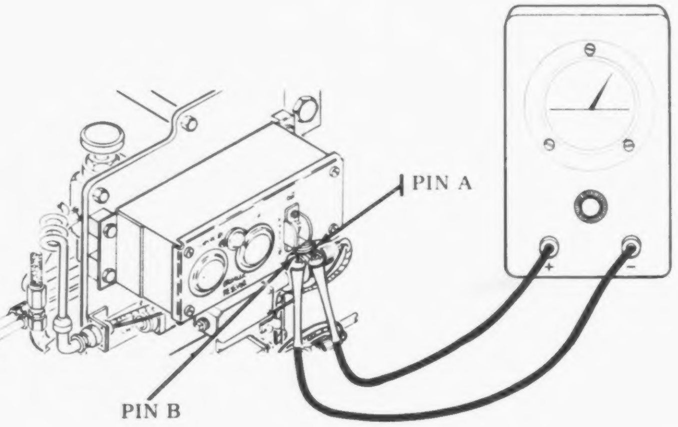


M Disconnect lead AAA from CONVEYOR control switch. Place red multimeter probe in switch. Ground black probe. Set MASTER switch ON. Set CONVEYOR control switch to IN position. If multimeter indicates voltage, go to step N. If no voltage is indicated, replace CONVEYOR control switch (p 6-125). Set MASTER switch OFF and connect lead AAA to CONVEYOR control switch.

TA310573

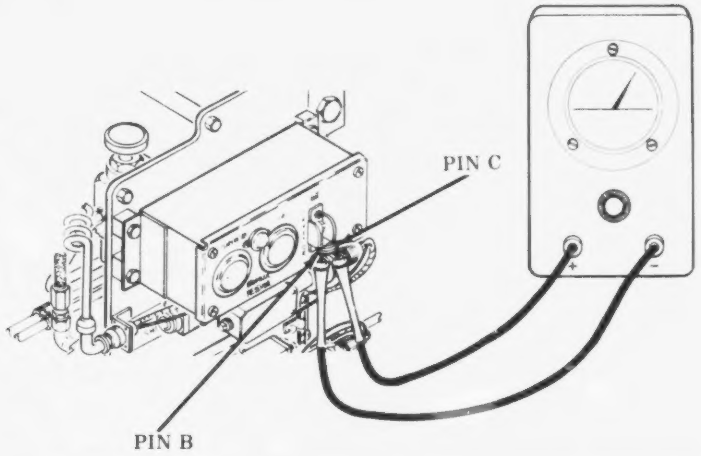


N Disconnect lead AAB from CONVEYOR control switch. Place red multimeter probe in switch. Ground black probe. Set MASTER switch ON. Set switch to OUT position. If multimeter indicates voltage, go to step O. If no voltage is indicated, replace CONVEYOR control switch (p 6-125). Set MASTER switch OFF and connect lead AAB to CONVEYOR control switch.

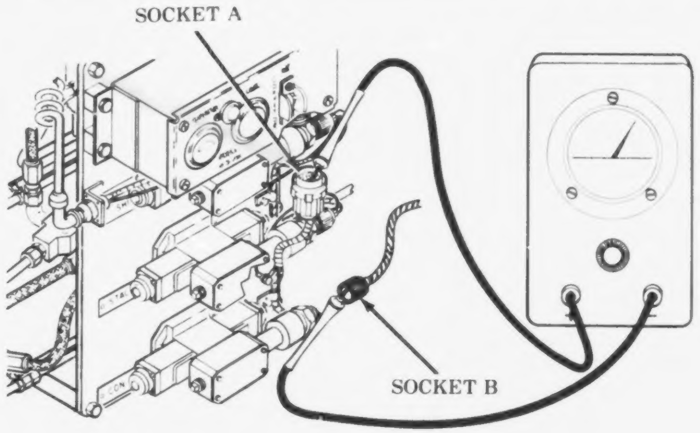


O Disconnect gage panel connector. Test lead continuity with a multimeter. Place red probe on connector pin A, and black probe to pin B of gage panel-mounted connector. Place CONVEYOR control switch to IN position. If multimeter indicates 0 ohms, go to step P. If multimeter remains on ∞, replace lead AAA between CONVEYOR control switch and gage panel connector (p 6-125).

TA310574

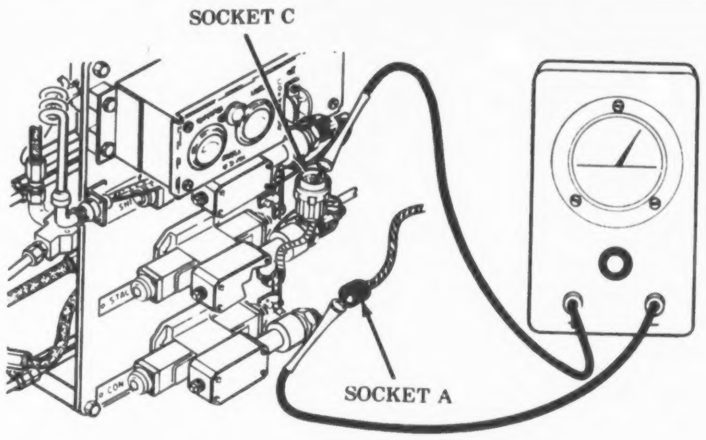


P Test lead continuity with a multimeter. Place red probe on connector pin C, and black probe to pin B of gage panel-mounted connector. Place CONVEYOR control switch in OUT position. If multimeter indicates O ohms, go to step Q. If multimeter remains on ∞, replace lead AAB between CONVEYOR control switch and gage panel connector control switch and gage panel connector (p 6-125). Assemble gage panel (p 6-125).

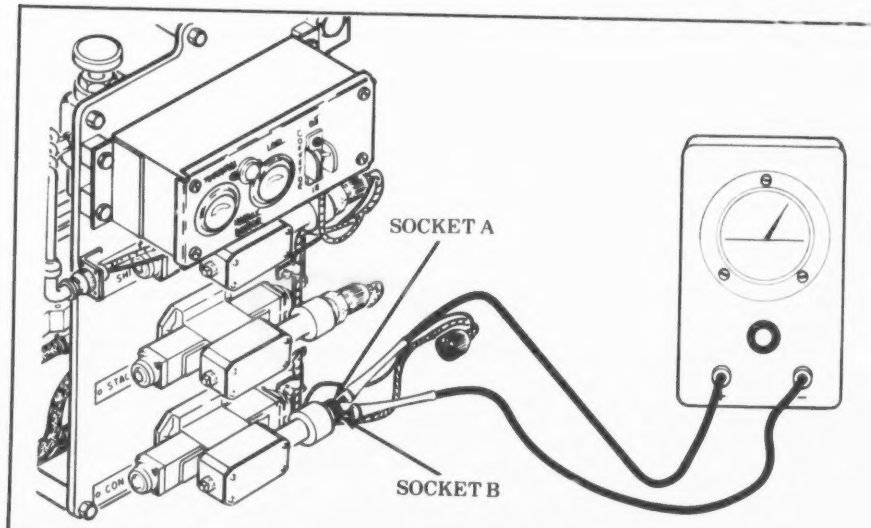


Q Disconnect harness connector from CONVEYOR direction control valve. Test lead continuity. Place multimeter red probe in gage panel connector socket A, and place black probe in solenoid connector pin B. If multimeter indicates 0 ohms, go to step R. If multimeter remains on ∞, lead AAA between gage panel connector and CONVEYOR direction control valve connector is defective. Notify Support Maintenance.

TA310575



R Place multimeter red probe in gage panel, connector socket C, and place black probe in CONVEYOR direction control valve connector pin A, and check continuity. If multimeter indicates 0 ohms, go to step S. If multimeter remains on∞, lead AAB between gage panel connector and CONVEYOR direction control valve connector is defective. Nofity Support Maintenance. Connect gage panel connector.



S Test direction control valve solenoid for resistance between control valve connector socket A and ground socket B. There should be an indication of approximately 22 ohms resistance. The reading should be the same between socket B and socket C. If not, replace direction control valve (p 16-8).

TA310576

UPPER REAR DOOR (BALLISTIC SHIELD)	**DOOR DOES NOT GO UP OR DOWN** Do steps A through N. **DOOR WILL NOT REMAIN IN OPEN POSITION** Do step O. **DOOR OPENS OR CLOSES ROUGHLY** Do steps A and C.

START HERE

WARNING

Test components must be capable of withstanding a minimum working pressure of 2000 psi. Also, never tighten hydraulic lines or fittings while hydraulic system is pressurized, damage to tubes and fittings could result in injury to personnel. Keep personnel clear of upper rear door area when troubleshooting.

Open lower rear door.

Vehicle MASTER switch ON.

APU operating primary hydraulic system and hydraulic system selector valve positioned IN (TM 9-2350-267-10).

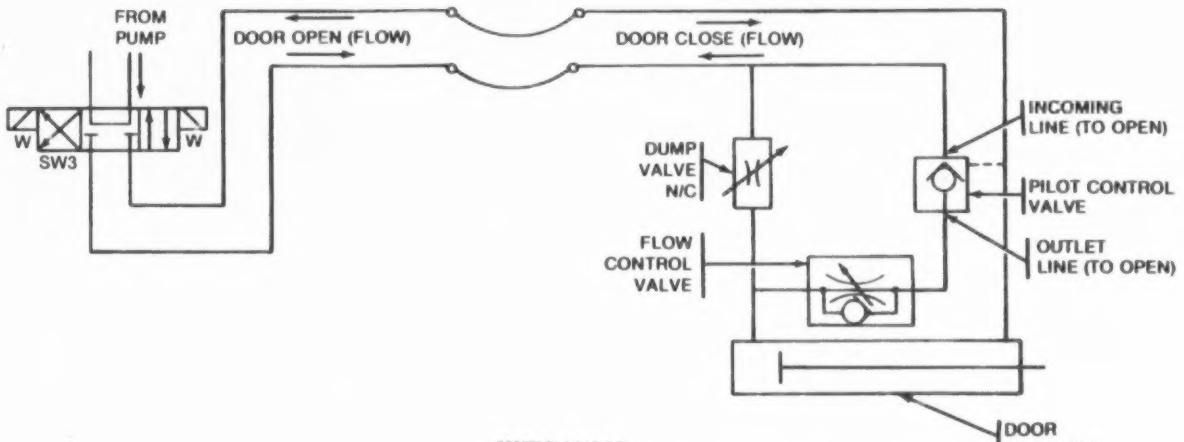
OR

Main engine operating backup hydraulic system and hydraulic system selector valve positioned OUT (TM 9-2350-267-10).

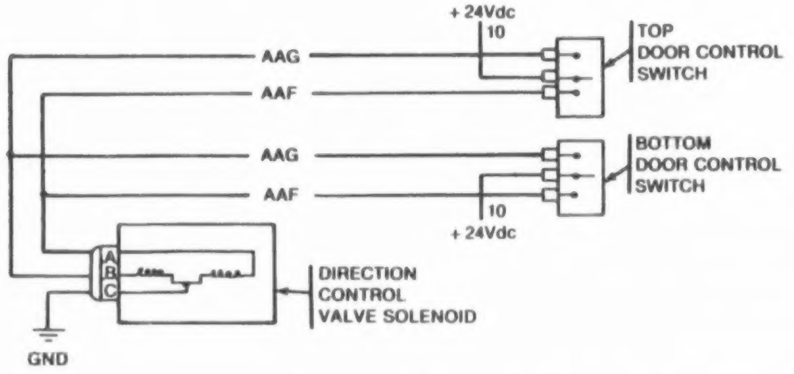
Check flow control valve adjustment (TM 9-2350-267-10).

Make sure dump valve is turned fully clockwise.

TA310577

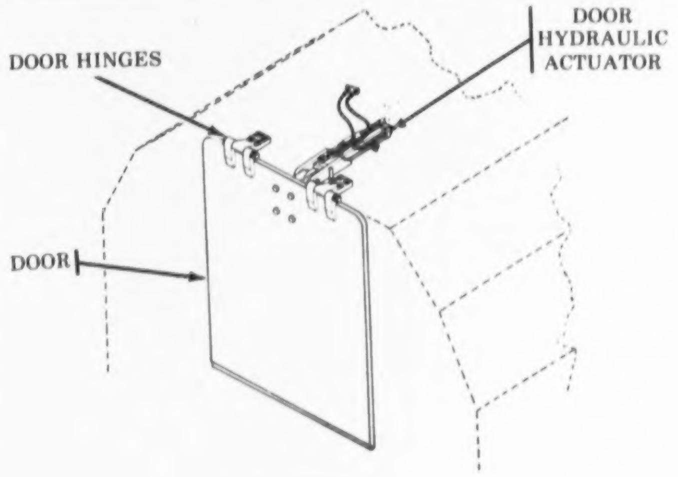

FROM PUMP
DOOR OPEN (FLOW)
DOOR CLOSE (FLOW)
W
SW3
T
T
W
INCOMING LINE (TO OPEN)
DUMP VALVE N/C
PILOT CONTROL VALVE
OUTLET LINE (TO OPEN)
FLOW CONTROL VALVE
DOOR ACTUATOR

HYDRAULIC SCHEMATIC

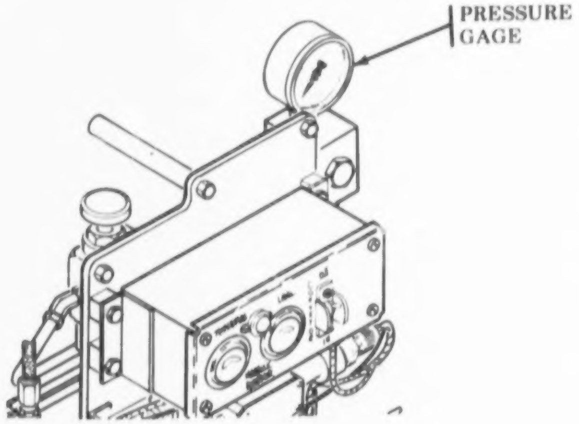

+24Vdc
10
AAG
AAF
TOP DOOR CONTROL SWITCH
AAG
AAF
BOTTOM DOOR CONTROL SWITCH
10
+24Vdc
A
B
C
DIRECTION CONTROL VALVE SOLENOID
GND

ELECTRICAL SCHEMATIC

TA310578



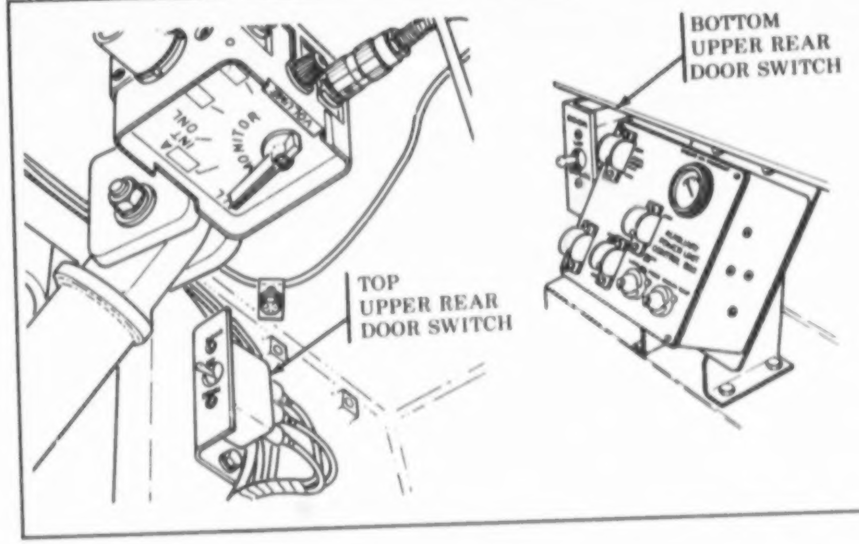
A Inspect door and door hinges for damage or binding. Replace or repair parts as required (p 9-29). Inspect door hydraulic actuator for damage or signs of fluid leakage. Replace or repair as required (p 9-30). Inspect oil tubes, hoses and fittings for signs of leakage. Repair or replace as required (p 16-30). If components are in satisfactory operating condition, go to step B.



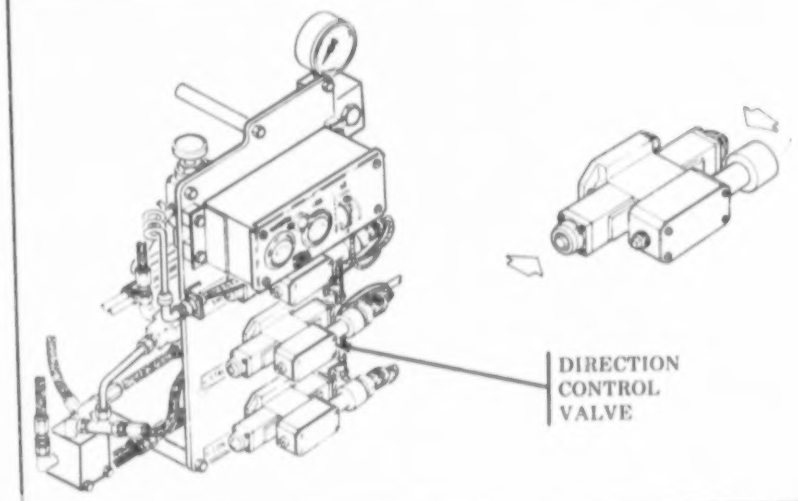
B Check hydraulic control panel pressure gage. Gage should indicate between 100 and 300 psi without system load.

Operate other hydraulic systems. If low pressure is indicated, or other hydraulic systems fail to operate, troubleshoot hydraulic system (p 2-242 or 2-244). If hydraulic control panel gage indicates sufficient system pressure and other hydraulic systems operate, go to step C.

TA310579

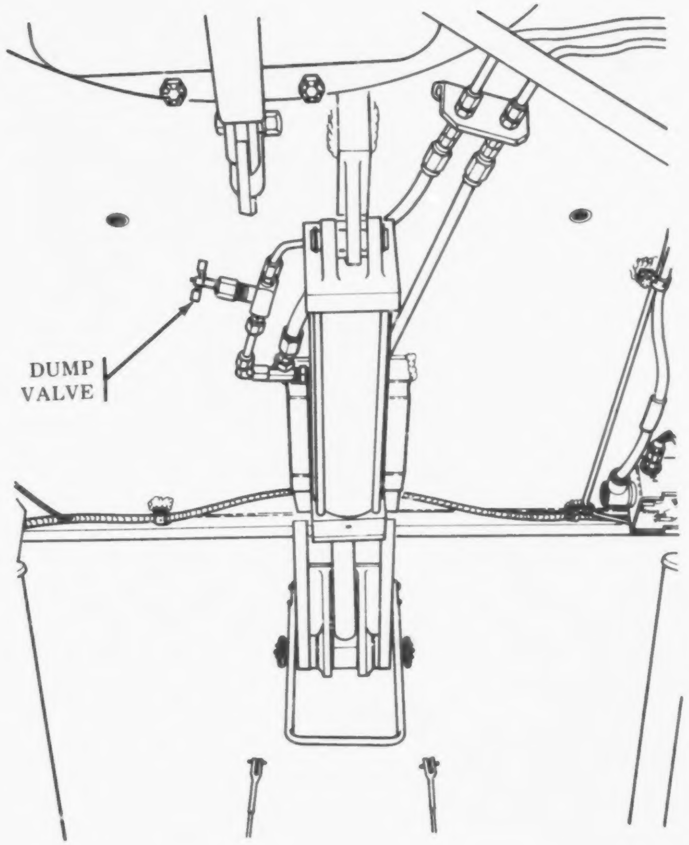

BOTTOM
UPPER REAR
DOOR SWITCH
TOP
UPPER REAR
DOOR SWITCH
MONITOR

C Attempt to open and close upper rear door first with top upper rear door switch and then bottom upper rear door switch. If only one switch opens and closes door, troubleshoot other switch circuit (step I). If both switches fail to open and close rear door, go to step D.


DIRECTION
CONTROL
VALVE

D Manually operate upper rear door direction control valve with override buttons located at both ends of valve. If valve sticks or does not return to center, after release, replace valve (p 16-8). If valve does not stick, returns to center after release, and door opens and closes, troubleshoot electrical circuits, step I. If valve does not stick, and returns to center after release, but door does not open or close, go to step E.

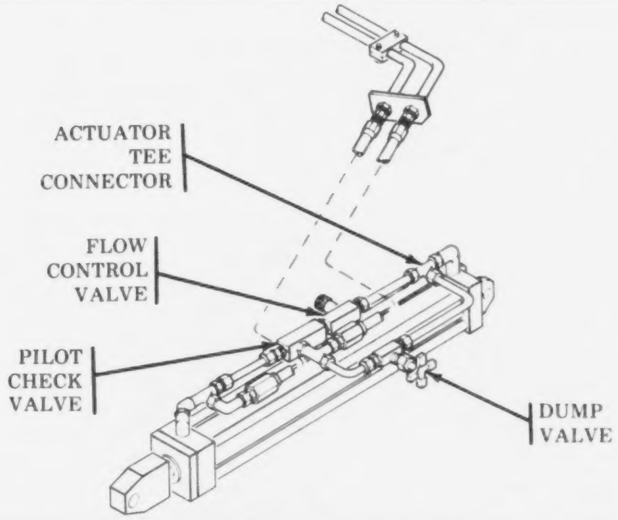
TA310580



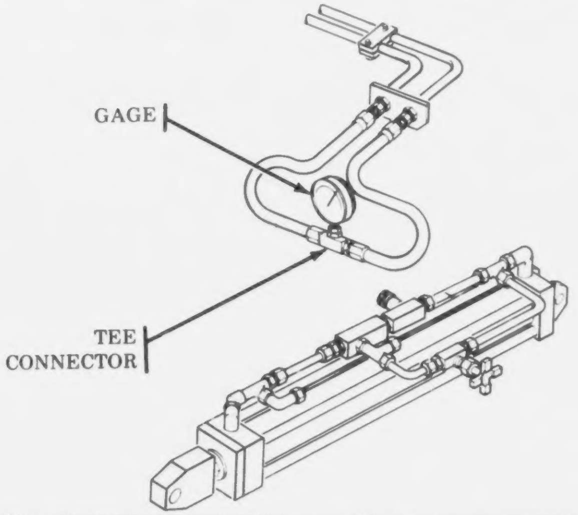
E Hold upper rear door switch in UP position and slowly open dump valve. If door opens, go to step F. If door does not open, shut down hydraulic system and go to step H.

F Close dump valve. Hold upper rear door switch in DOWN position. Slowly open dump valve. If door closes, go to step G. If door does not close, shut down hydraulic system and go to step H.

TA310581

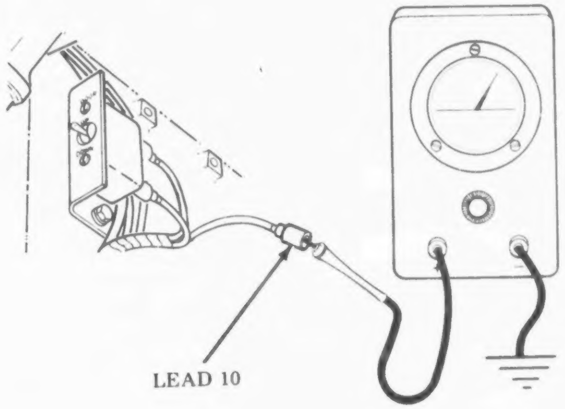


G Close dump valve. Shut down hydraulic system. Disconnect hydraulic actuator from rear door (p 9-30) and allow to hang from ceiling. Remove flow control valve, and hydraulic line to actuator tee connection. Install jumper hose between pilot check valve and actuator tee connection. Reinstall actuator to upper rear door (p 9-30). Turn on hydraulic system. Hold upper rear door switch in UP position. If actuator opens door, replace flow control valve. If actuator does not open door, replace pilot check valve (p 16-30).



H Remove inlet and outlet hydraulic hoses from tee connectors. Install tee connector and gage between inlet and outlet hoses. Turn on hydraulic system. Operate upper rear door switch in both UP and DOWN position. Gage should indicate at least 300 psi. If limited, or no pressure is indicated, replace or repair hydraulic lines between actuator and direction control valve. If sufficient pressure is indicated, replace actuator (7) (p 16-30).

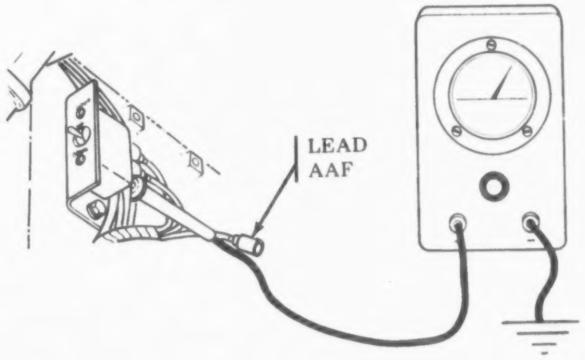
TA310582



NOTE

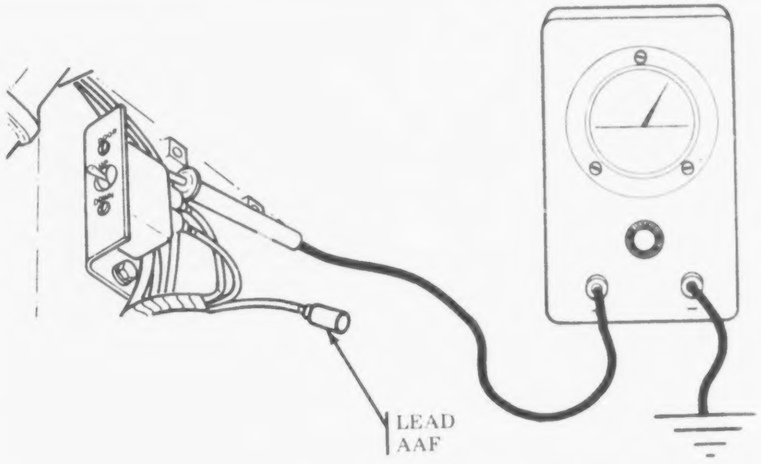
Troubleshoot both top and bottom upper rear door switches in same manner.

I Shut down hydraulic system. Disconnect lead 10 from center switch connector. Place red probe of multimeter in lead 10 and ground black probe. Set MASTER switch ON. Multimeter should indicate voltage. If no voltage is indicated, lead 10 to switch is defective. Notify Support Maintenance. If voltage is indicated, go to step J. Reconnect lead 10 to switch.

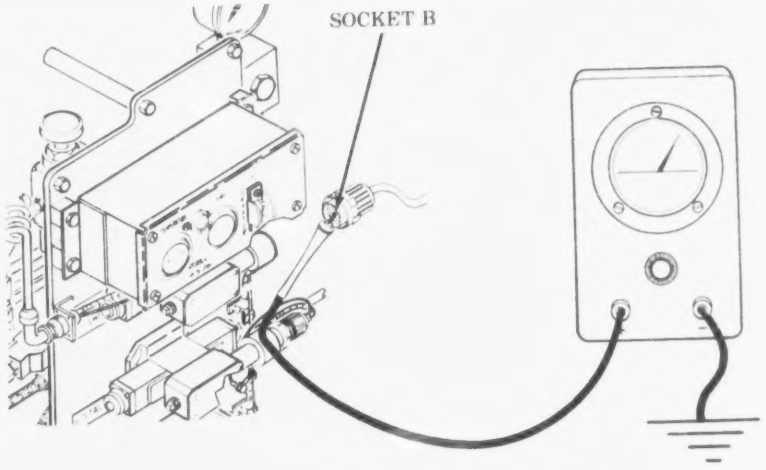


J Disconnect lead AAF from switch. Place red probe of multimeter in switch and ground black probe. Set MASTER switch ON. Hold switch in UP position. Multimeter should indicate voltage. If no voltage is indicated replace upper rear door switch (p 6-61). If voltage is indicated, go to step K. Reconnect lead AAF to switch.

TA310583

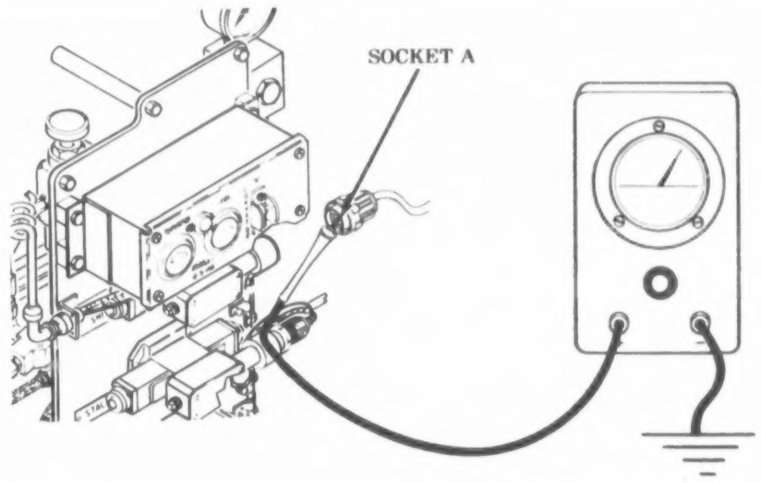


K Set MASTER switch OFF. Disconnect lead AAG from switch. Place red probe of multimeter in switch and ground black probe. Set MASTER switch ON. Hold switch in DOWN position. Multimeter should indicate voltage. If no voltage is indicated, replace upper rear door switch (p 6-61). If voltage is indicated, go to step L. Reconnect lead AAF to switch.

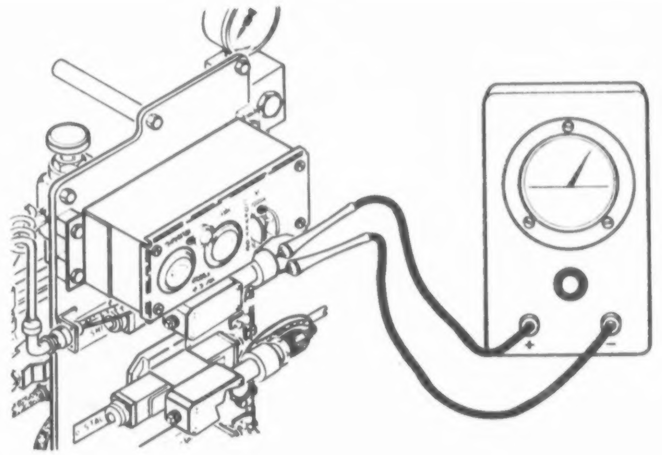


L Set MASTER switch OFF. Disconnect harness connector from ballistic shield direction control valve solenoid. Place red probe of multimeter on pin B and ground black probe. Set MASTER switch ON. Place top upper rear door switch in DOWN position. Multimeter should indicate voltage. If no voltage is indicated, lead AAG between solenoid and top rear door switch is defective. Notify Support Maintenance. Place bottom upper rear door switch in DOWN position. If multimeter does not indicate voltage, lead AAG to bottom switch is defective. Notify Support Maintenance. If voltage is indicated on both switch circuits, go to step M.

TA310584

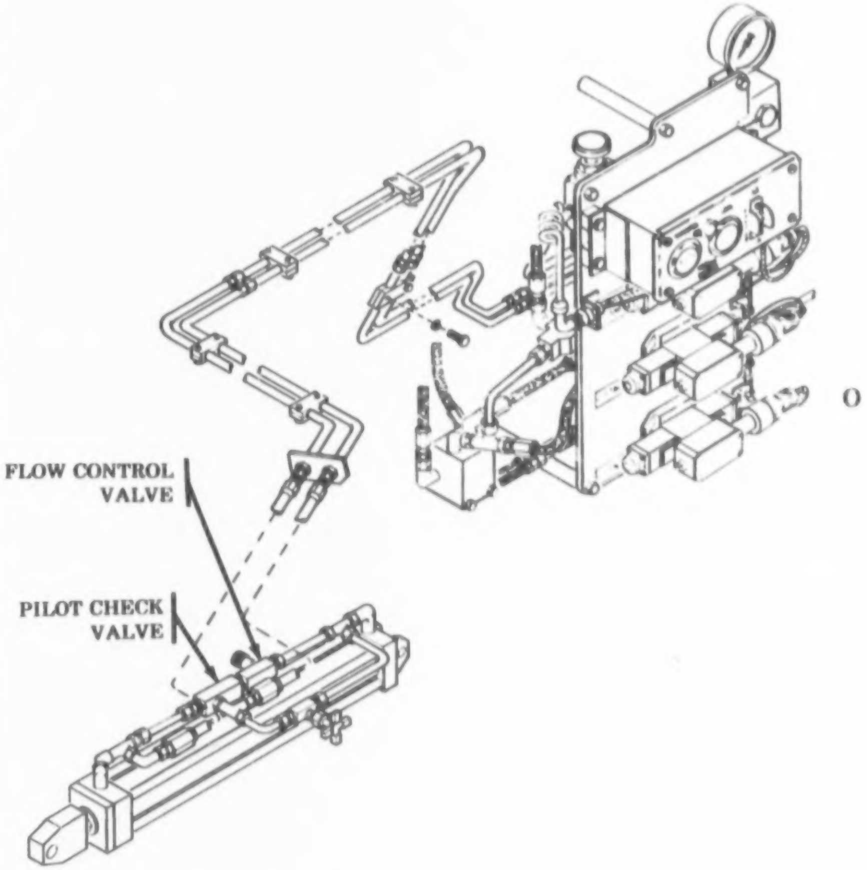


M Place red probe of multimeter in socket A, and ground black probe. Place top upper rear door switch in UP position. Multimeter should indicate voltage. If no voltage is indicated, lead AAF between top upper rear door switch and solenoid is defective. Nofity Support Maintenance. Place bottom upper rear door switch in UP position. Multimeter should indicate voltage. If no voltage is indicated, lead AAF between bottom upper rear door switch and solenoid is defective. Notify Support Maintenance. If voltage is indicated on both switch circuits, go to step N. Set MASTER switch OFF.



N If voltage is indicated at direction control valve connector terminals, test for resistance across solenoid open circuit, terminals A to C. Multimeter should indicate 22 ohms. Test close circuit, terminals C to B. The multimeter should indicate 22 ohms. If not, replace direction control valve (p 16-8). Reconnect harness connector to ballistic shield direction control valve.

TA310585



O Shut down hydraulic system. Inspect hydraulic lines and fittings for leakage. Repair or replace as required (p 16-24). Turn on hydraulic systems, and open upper rear door. Close flow control valve. If door does not remain open, replace door actuator (p 9-30). Open flow control valve. If door does not remain open, replace pilot check valve (p 16-30).

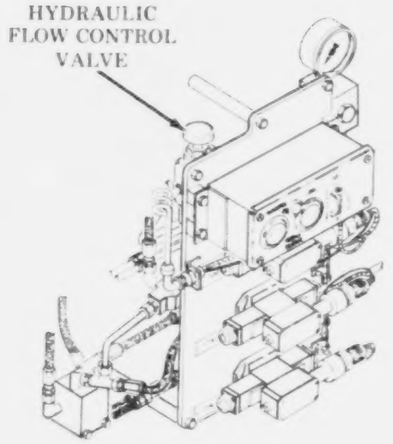
TA310586

STACKER	**PROJECTILE TRAY DOES NOT MOVE UP OR DOWN** Do steps A through N. **PROJECTILE TRAY RAISES AND LOWERS ROUGHLY** Do steps A through N. **PROJECTILE TRAY MOVES IN ONE DIRECTION ONLY** Do steps A through N. **PROJECTILE TRAY FAILS TO HOLD** Do step O.

START HERE

WARNING

Test components must be capable of withstanding a working pressure of 2000 psi. Also, never tighten hydraulic lines or fittings while hydraulic system is pressurized. Damage to tubes and fittings could result in injury to personnel.



TA310587

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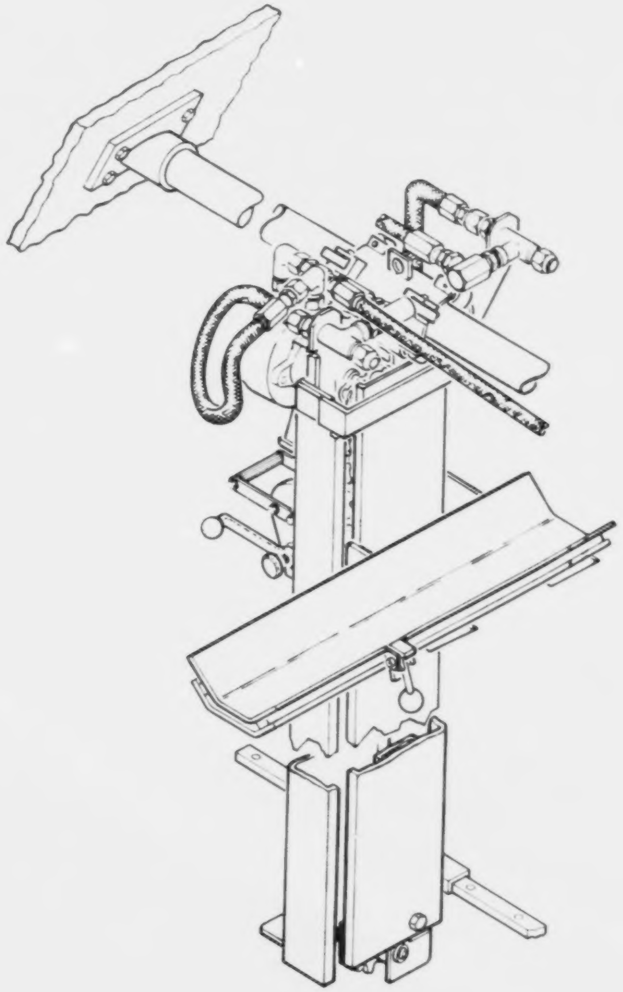


Before troubleshooting stacker, check the following:

Vehicle MASTER switch is ON. APU is operating primary hydraulic system and hydraulic system selector valve is pushed in.

OR

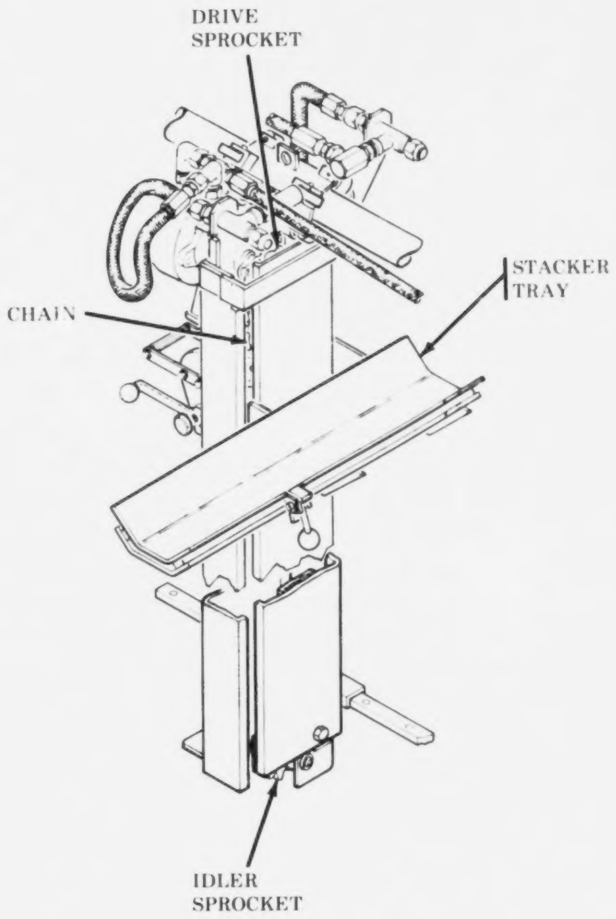
Main engine is operating backup hydraulic system and hydraulic system selector valve is pulled out.

Make sure hydraulic flow control valve is set for adequate flow to stacker motor.

NOTE

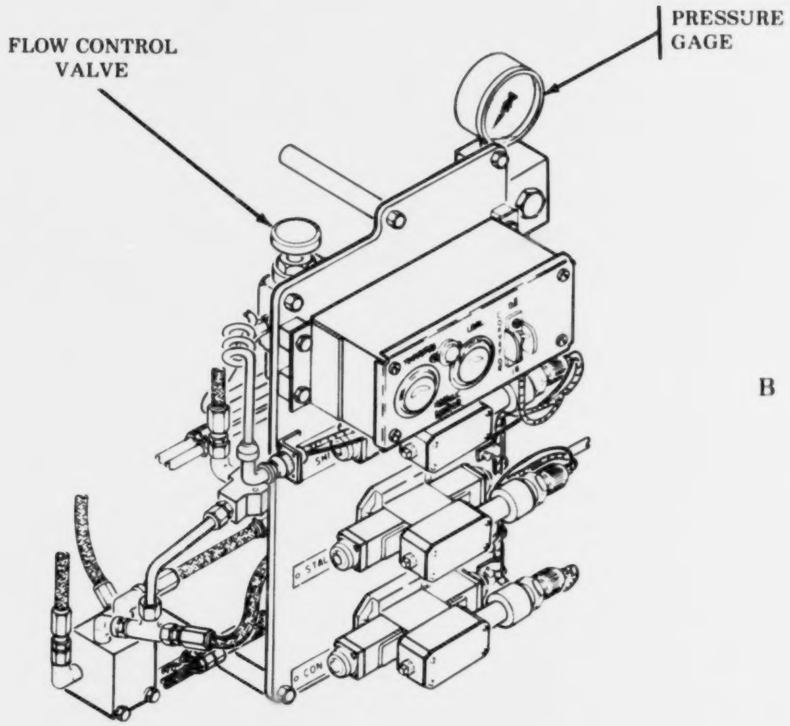
The stacker tray control switches are momentary ON push buttons and must be pushed in and held when operating the stacker tray.

TA312706



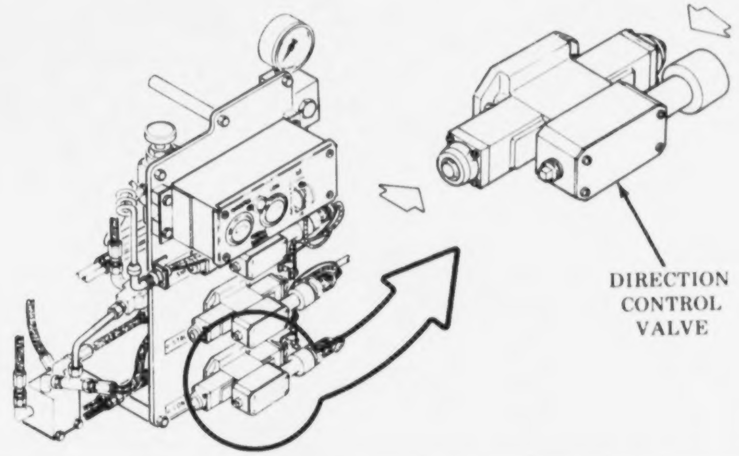
A Shut down hydraulic system. Visually check roller chain. Inspect for breakage and binding. Check chain alinement (TM 9-2350-267-10). Inspect chain path for obstructions. Make sure tray is secured to chain (p 12-32). Check sprockets for missing teeth. Make sure sprocket is tight on motor shaft. Tighten setscrew or replace key (p 12-34). Inspect Idler sprocket bearing for wear, sticking or binding shafts (p 12-39). If components are in good working condition and stacker tray will not raise or lower, go to step B.

TA312707

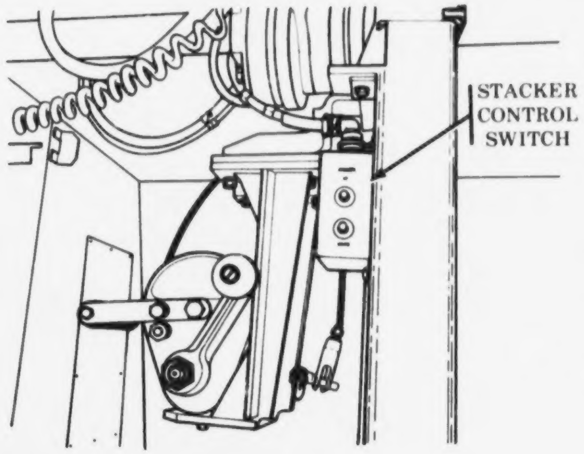


B Turn on hydraulic system. Check hydraulic panel pressure gage. Gage should indicate 100 to 300 psi. If gage indicates low pressure, troubleshoot hydraulic system (p 2-242 and 2-244). If gage indicates correct pressure, balance flow control valve. If stacker fails to function properly go to step C.

TA310590

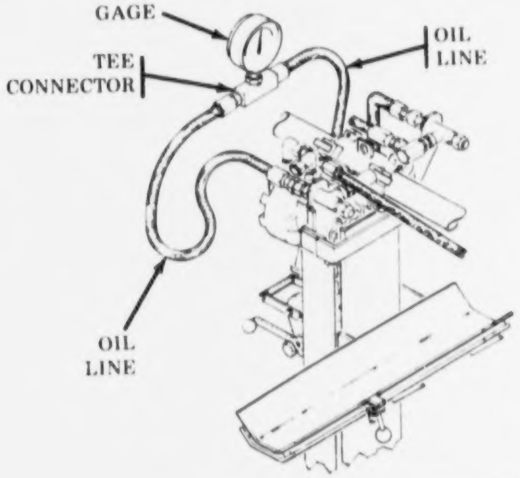

DIRECTION
CONTROL
VALVE

C Operate hydraulic control panel stacker solenoid direction control valve manually in both directions. If valve does not function properly, replace direction control valve (p 16-8). If valve operates properly, go to step D.


STACKER
CONTROL
SWITCH

D Operate stacker control switch. If switch fails to actuate direction control valve, troubleshoot stacker electrical system, do step F. If switch functions properly, go to step E.

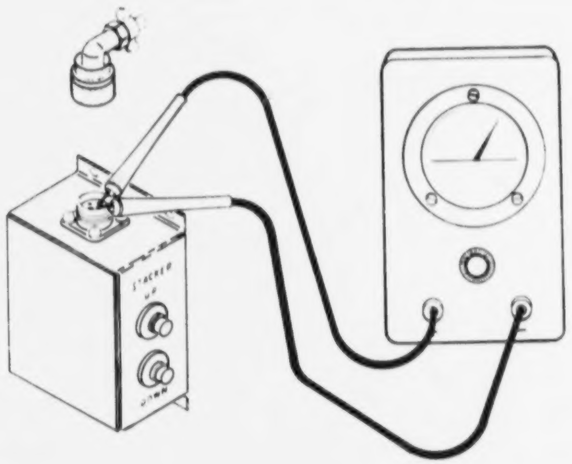
TA310591



E Shut down hydraulic system. Disconnect hydraulic oil lines from stacker motor. Install tee connector and pressure gage between oil lines. Turn on hydraulic system. Operate stacker system in both directions. Line pressure should be indicated in both directions; if not, go to step N. If pressure is indicated in both directions, reconnect lines to motor and separate hydraulic brake from stacker motor. Operate system in both directions. If motor functions replace hydraulic brake (p 12-42). If motor does not function, replace motor (p 12-43).

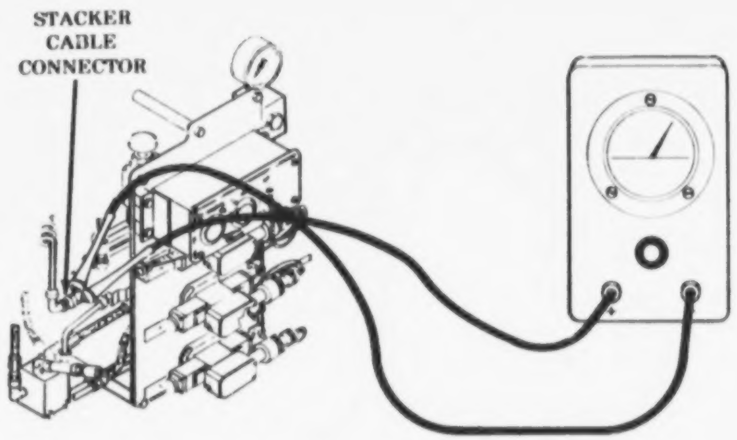
NOTE

If motor makes grinding or scraping noises during operation, replace stacker motor.

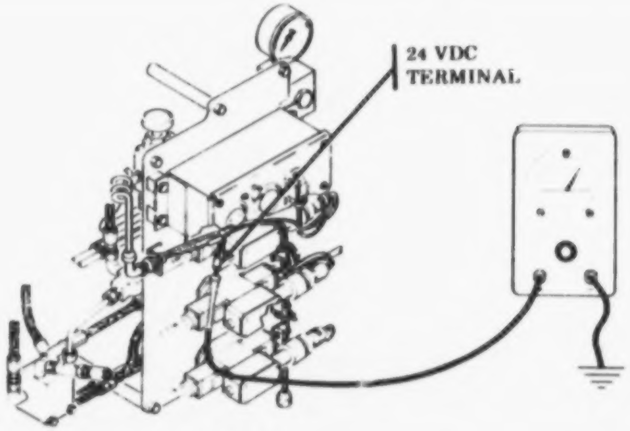


F Set MASTER switch to OFF. Disconnect electrical cable at STACKER control switch box. Test UP push button for continuity between socket A and B. Test DOWN push button between terminals C and D. If switch is defective, repair or replace (p 6-59). If switch is not defective, go to step G. Reconnect cable at control switch.

TA312708

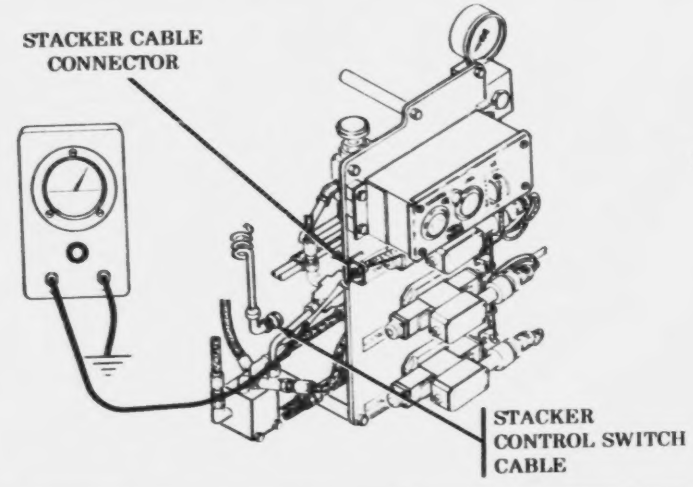


G Disconnect stacker control switch cable at stacker cable connector. Press UP push button of stacker control switch box and test cable lead continuity between pins A and B. Press DOWN push button and test cable lead continuity between pins C and D. If cable is defective, repair or replace (p 6-122). If cable is not defective, go to step H.

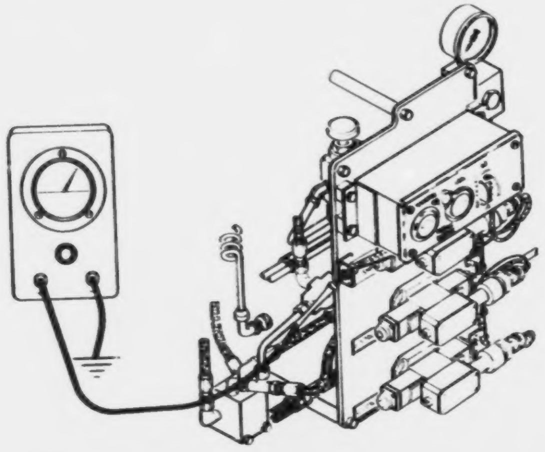


H Disconnect 24 vdc terminal. Place red probe of multimeter on incoming terminal, and ground black probe to check voltage. Set MASTER switch ON. If multimeter indicates voltage, go to step I. If no voltage is indicated, notify Support Maintenance. Set MASTER switch OFF and reconnect 24 vdc terminal.

TA310593

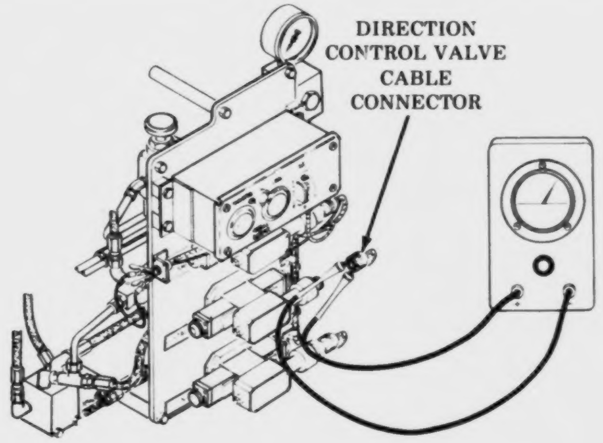


I Place red probe of multimeter in socket B at stacker cable connector, and ground black probe to check voltage. Set MASTER switch ON. If multimeter indicates voltage, go to step J. If no voltage is indicated, repair or replace cable (p 6-122). Set MASTER switch OFF.

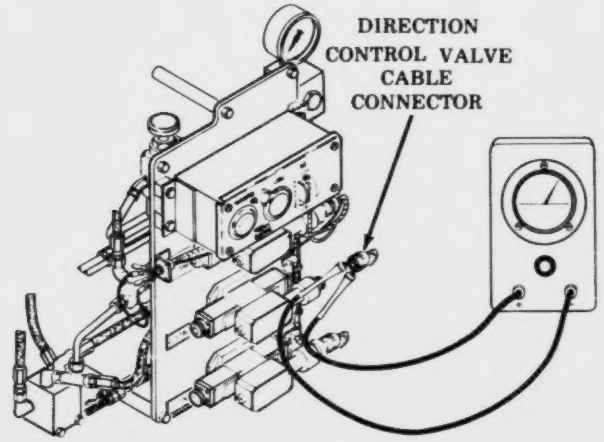


J Place red multimeter probe in socket D at stacker cable connector, and ground black probe to test voltage. Set MASTER switch ON. If multimeter indicates voltage, go to step K. If no voltage is indicated, repair or replace cable (p 6-122). Set MASTER switch OFF. Reconnect stacker control switch cable.

TA310594

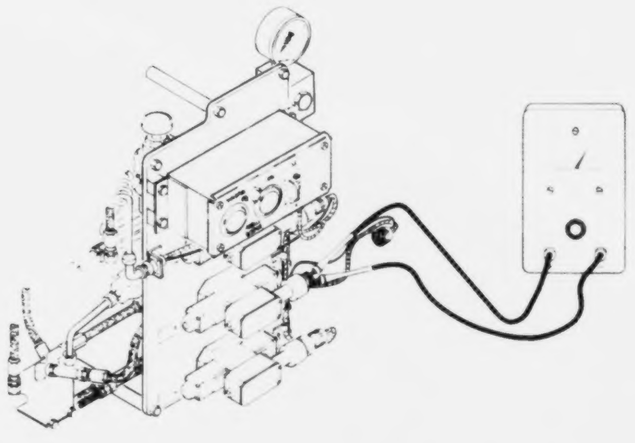

DIRECTION
CONTROL VALVE
CABLE
CONNECTOR

K Disconnect cable connector at stacker direction control valve. Check voltage by placing red probe of multimeter on direction control valve cable connector pin A and position black probe on pin C. Set MASTER switch ON. Press UP button on STACKER control switch box. If multimeter indicates voltage, go to step L. If no voltage is indicated, repair or replace cable (p 6-122). Set MASTER switch OFF.

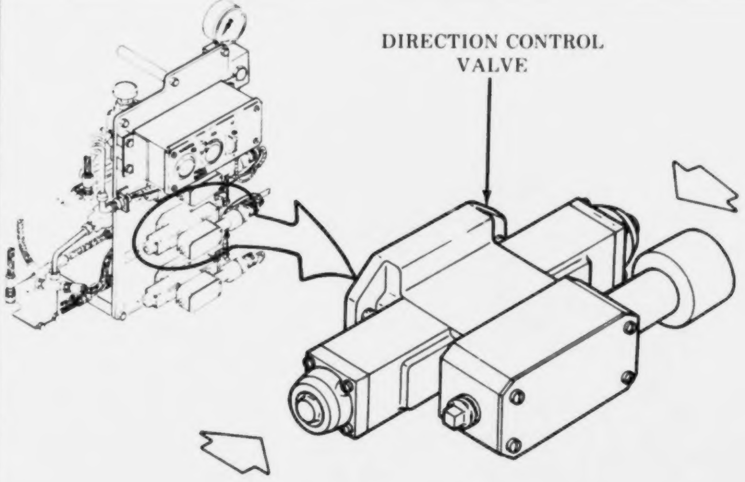

DIRECTION
CONTROL VALVE
CABLE
CONNECTOR

L Place red probe of multimeter on direction control valve cable connector pin B and position black probe on pin C. Set MASTER switch ON. Press DOWN button on STACKER control switch box. If multimeter indicates voltage, go to step M. If no voltage is indicated, repair or replace cable (p 6-122). Set MASTER switch OFF.

TA310595

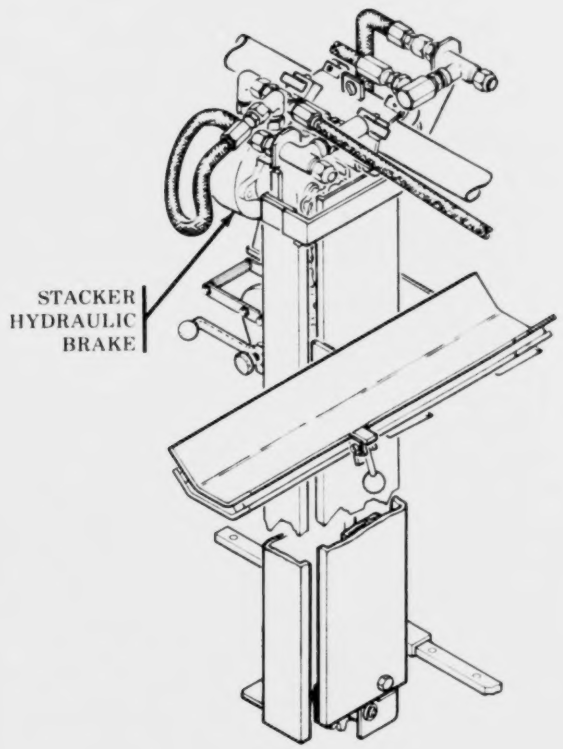


M Test direction control valve solenoid resistance between solenoid socket A and C, and B and C. Each test should indicate approximately 22 ohms resistance. If not, replace stacker direction control valve (p 16-8). Reconnect all cables.



N Replace direction control valve (p 16-8). If stacker does not raise or lower, raises or lowers roughly, or raises or lowers in one direction only, replace shuttle valve (p 16-8).

TA310596


STACKER HYDRAULIC BRAKE

O Troubleshoot solenoid direction control valve, step C. If solenoid direction control valve functions properly, remove stacker hydraulic brake and send to Support Maintenance for repair.

TA312709

STACKER	**MOVES WITH DIFFICULTY ACROSS CARGO COMPARTMENT** **Do steps A through C.**

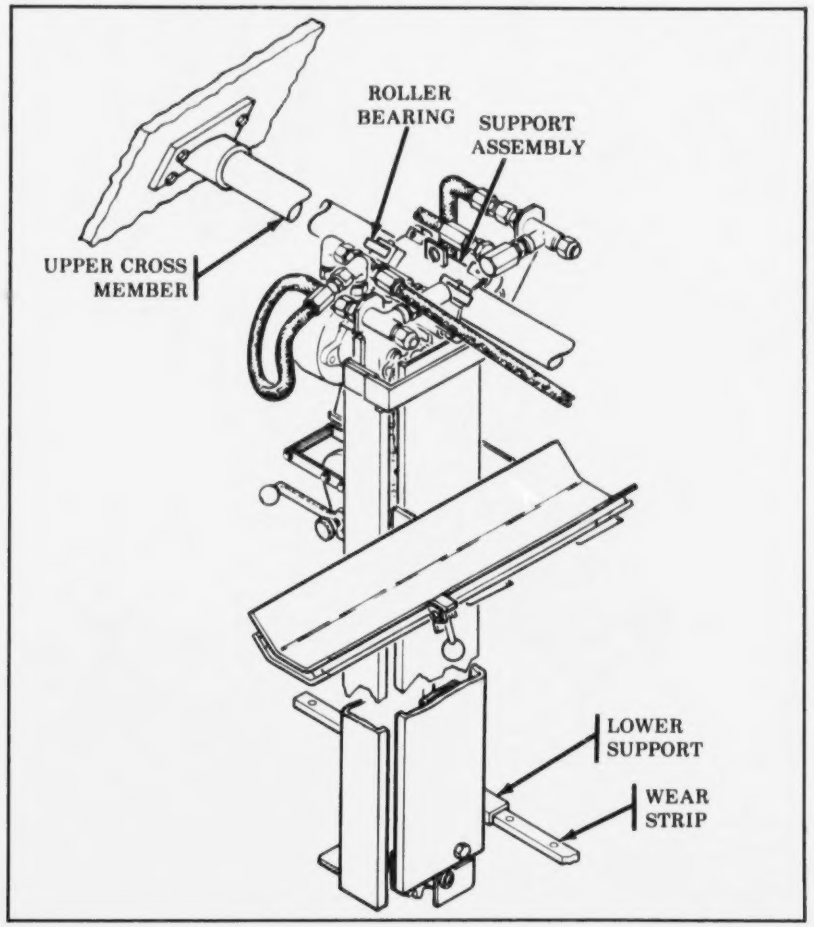
START HERE

A Check upper cross member for misalinement, dents, bends, corrosion, rust or other damage. Replace if defective. Refer to replacement procedure (p 12-45).

B Check roller bearing on support assembly for corrosion, rust, excessive wear or flat spots and binding. Replace if defective. Refer to replacement procedure (p 12-45).

C Check wear strip and lower support for misalinement, wear, damage, corrosion or blockage. Replace or repair if defective. Refer to replacement procedures (p 12-43).

D Check routing of hydraulic hoses to ensure there is n obstruction of movement (p 16-32).


ROLLER BEARING
SUPPORT ASSEMBLY
UPPER CROSS MEMBER
LOWER SUPPORT
WEAR STRIP

TA312710

STACKER	**WINCH DOES NOT OPERATE** **Do steps A through C.**

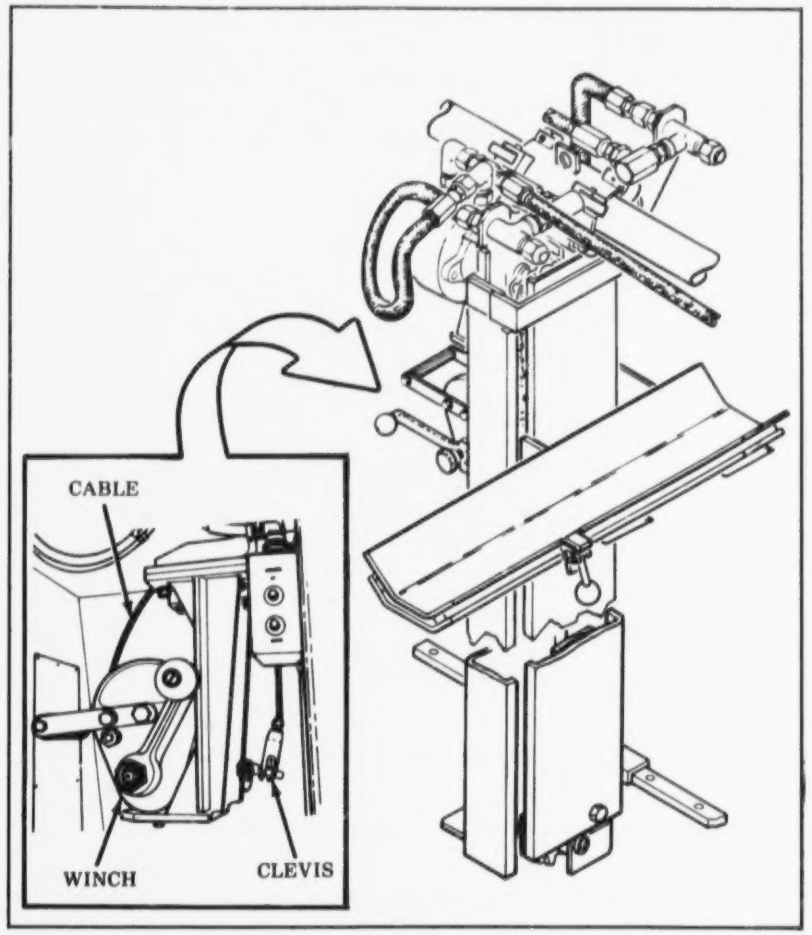
START HERE

A Make sure stacker tray is disconnected from stacker chain.

B Check for broken winch cable. Replace if broken. Refer to replacement procedure (p 12-33).

C Check for damaged or broken cable clevis. Replace if defective. Refer to replacement procedure (p 12-33).

D If winch handle does not turn, inspect for stripped, worn or broken gears. Replace winch if defective. Refer to replacement procedure (p 12-33).



TA312711

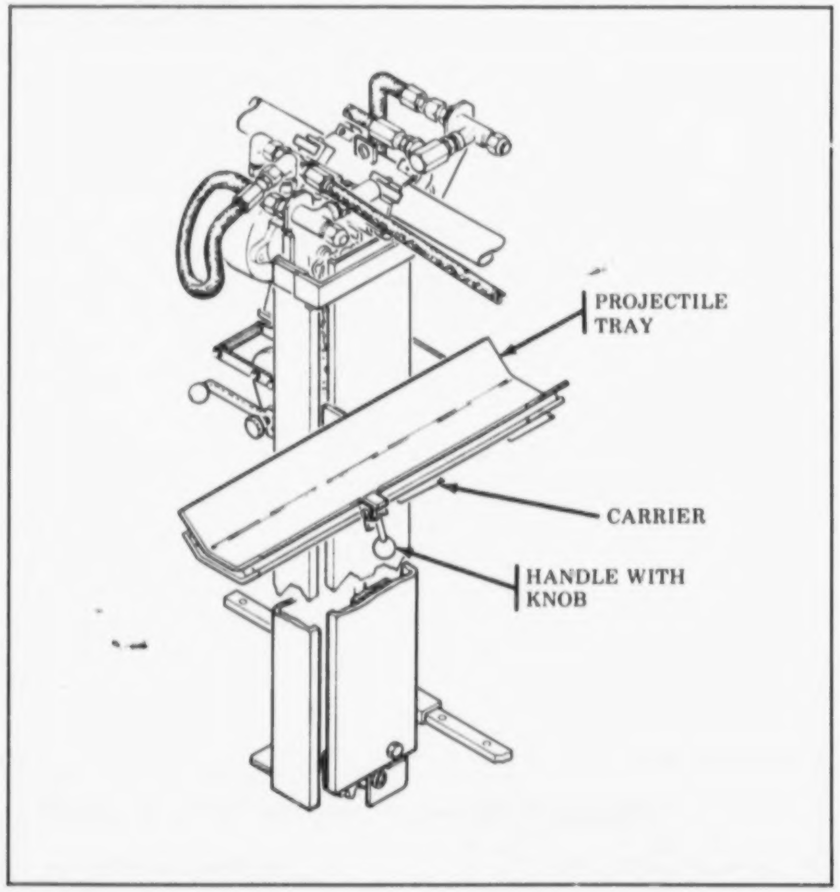
STACKER	**PROJECTILE TRAY WILL NOT SLIDE OR SLIDES WITH DIFFICULTY** **Do steps A through C.** **PROJECTILE TRAY DOES NOT LOCK IN POSITION** **Do steps B and C.**

START HERE

A Visually inspect projectile tray and carrier for damage, breaks, bending, warping, rust and corrosion. Replace if defective. Inspect stacker tray slide bars and guides. Refer to replacement procedure (p 12-36 thru p 12-38).

B Examine handle with knob for damage or breaks. Inspect mounting tabs for security, cracking, corrosion or other damage. Replace handle and knob if defective and replace tray if mountings are broken. Refer to replacement procedure (p 12-36).

C Examine carrier handle slots for corrosion, blockage or other damage. Repair or replace carrier if slots are defective. Refer to replacement procedures (p 12-36).



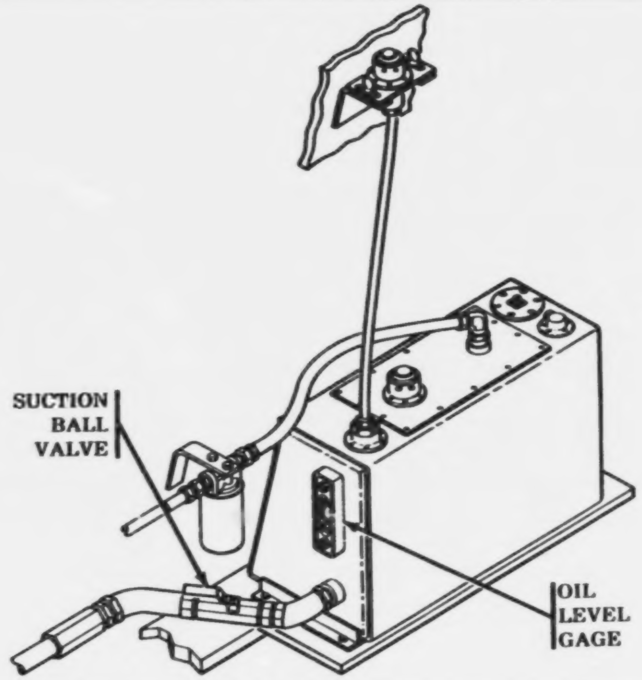
TA312712

PRIMARY HYDRAULIC PUMP	**INSUFFICIENT OR NO SYSTEM PRESSURE** Do steps A through E. **LOSS OF HYDRAULIC PRESSURE DURING OPERATION** Do steps A through E.

START HERE

NOTE

System pressure is indicated at the hydraulic control panel pressure gage. System pressure should be 100-300 psi without system load.



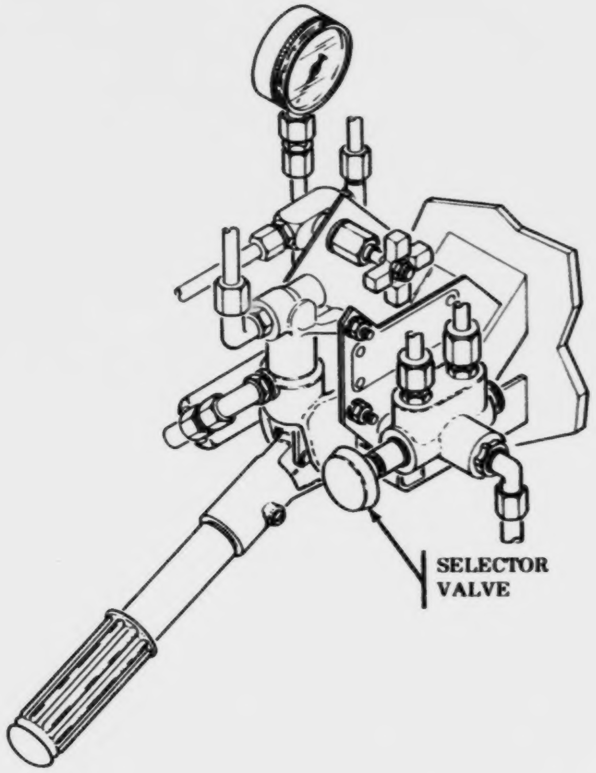
NOTE

Vehicles 345 and above do not have a sight gage on hydraulic reservoir.

A Make sure suction ball valve from reservoir is open.

B Check hydraulic oil level at hydraulic reservoir. If low, fill to proper level with approved grade of hydraulic oil (LO 9-2350-267-12). If oil level is sufficient, go to step C.

TA57421



C Make sure hydraulic system selector valve is in the IN position (TM 9-2350-267-10). If selector valve is in proper position, go to step D.

D Inspect hydraulic lines, connections and fittings for leaks or other damage. Replace or repair lines, connections, and fittings (p 16-15). If lines are satisfactory, go to step E.

E Shut down APU. Attempt to start APU. If APU starts and system pressure is still low, replace primary hydraulic pump (p 13-21). If starter/generator spins but does not turn APU over, and APU fails to start, notify Support Maintenance to check pump/starter/generator drive chain.

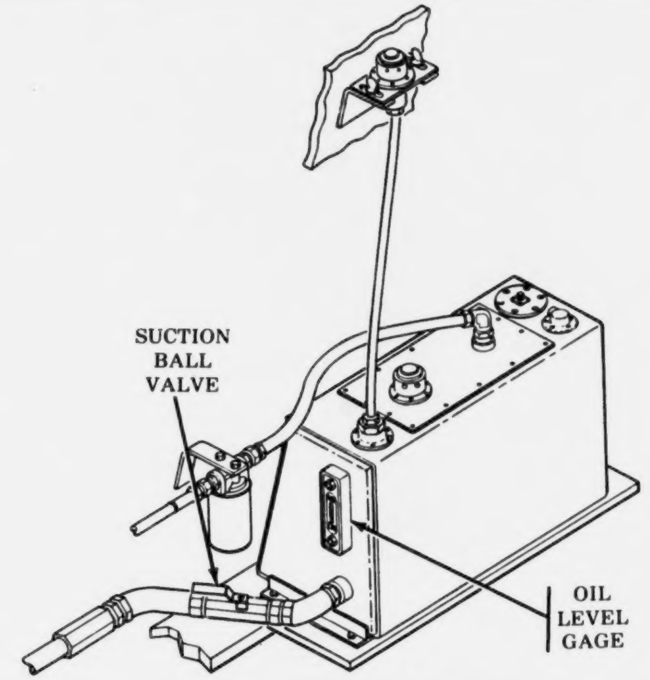
TA310602

BACKUP HYDRAULIC SYSTEM	**PUMP DOES NOT OPERATE** Do steps A through E. **PUMP OPERATES INTERMITTENTLY** Do step F.

START HERE

NOTE

The main engine must operate at 1100 rpm for efficient pump operation.



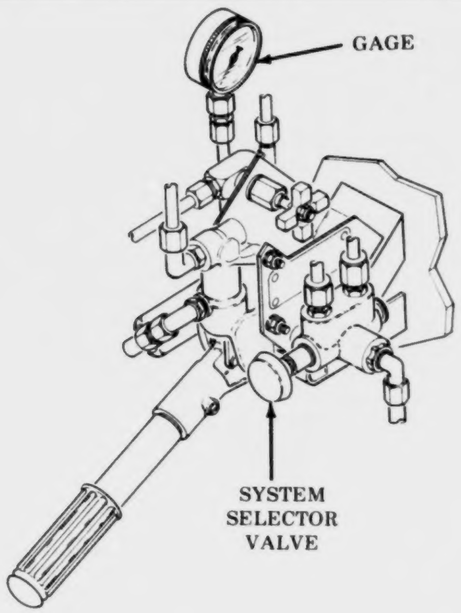
NOTE

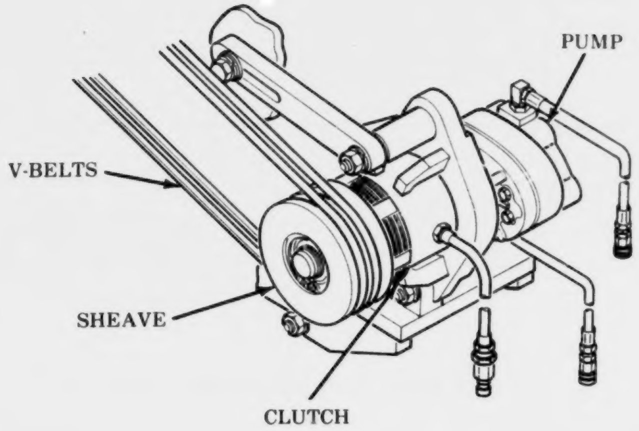
Vehicles 345 and above do not have a sight gage on hydraulic reservoir.

A Make sure suction ball valve is open.

B Check hydraulic oil level at hydraulic reservoir. If low, fill to proper level with approved grade of hydraulic oil (LO 9-2350-267-12). If oil level is sufficient, go to step C.

TA57422





C Make sure hydraulic system selector valve is in OUT position. If selector valve is in proper position, go to step D.

WARNING

Hand pump pressure must not exceed 150 psi.

D Check that hand pump assembly gage indicates between 125-150 psi. If it does not, make sure pump valve is closed. Then pump the hand pump assembly while observing gage. If it does, go to step E. If it does not, check hand pump hoses and tubing to bulkhead for leakage (p 16-15). If no leakage is indicated, replace or repair hand pump. Refer to replacement procedures (p 16-27).

NOTE

To gain access to the backup pump hydraulic clutch and hydraulic lines, it is necessary to remove engine compartment access cover. Refer to removal procedures (p 9-25).

E Check hydraulic lines and fittings from clutch and pump assembly to bulkhead. Inspect for leaks or other damage. If backup system still does not operate, notify Support Maintenance.

F Inspect V-belts from main engine to clutch-mounted sheave. Check for slipping which could cause intermittent or no operation. Tighten and aline V-belts (p 16-26).

TA310604

NBC VENTILATED FACE-PIECE SYSTEM	**INSUFFICIENT OR NO AIR FLOW AT QUICK-DISCONNECT FITTINGS** **Do step A through H.** **AIR PURIFIER MOTOR DOES NOT OPERATE** **Do step C.** **M3 HEATER DOES NOT OPERATE** **Do steps I and J.**

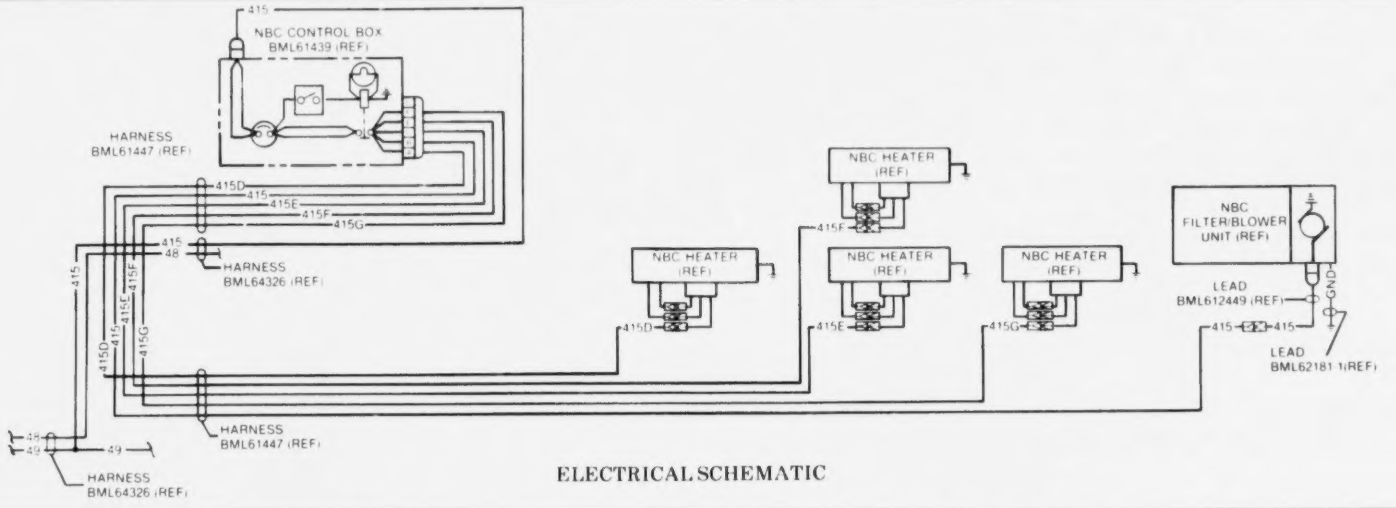
START HERE

NOTE

MASTER switch ON.

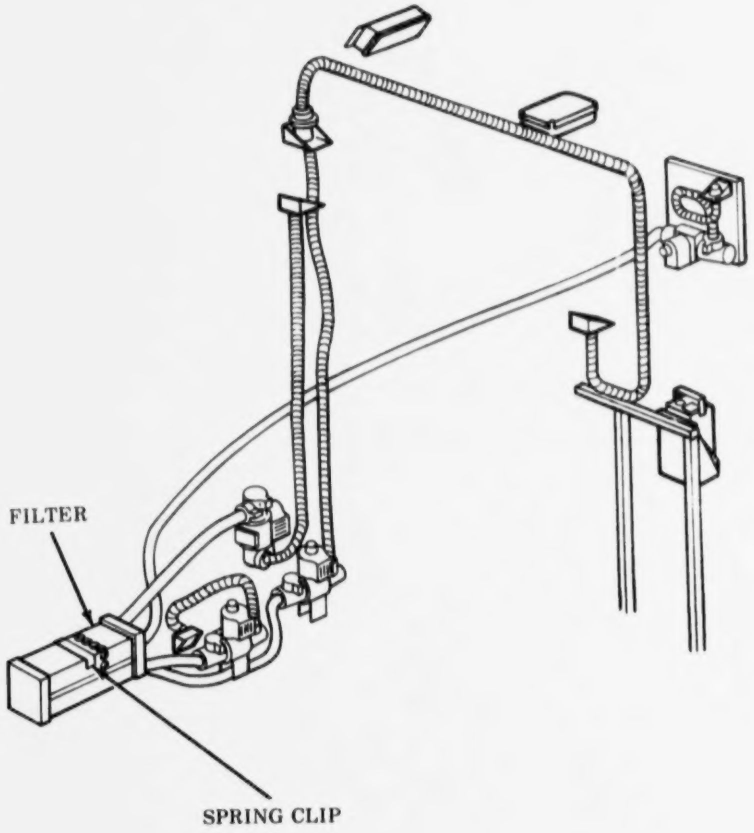
WARNING

To prevent possible chemical or biological agent casualties, contaminated gas and particulate filters must be removed and disposed of only by adequately trained personnel (TM 21-40). The unit commander or senior officer in charge of maintenance personnel assigned to remove and dispose of contaminated gas filters must prescribe the necessary protective clothing (TM 10-277) to be worn during this operation. He must also prescribe the necessary safety measures to be followed, including the decontamination that must be performed before new gas filters are installed in the housing assembly (TM 3-220).


415
NBC CONTROL BOX
BML61439 (REF)
HARNESS
BML61447 (REF)
415D
415
415E
415F
415G
415
48
HARNESS
BML64326 (REF)
415
415D
415
415E
415F
415G
HARNESS
BML61447 (REF)
48
49
49
HARNESS
BML64326 (REF)
NBC HEATER
(REF)
415F
NBC HEATER
(REF)
415D
NBC HEATER
(REF)
415E
NBC HEATER
(REF)
415G
NBC
FILTER/BLOWER
UNIT (REF)
GND
LEAD
BML612449 (REF)
415
415
LEAD
BML62181 1(REF)

ELECTRICAL SCHEMATIC

TA310605

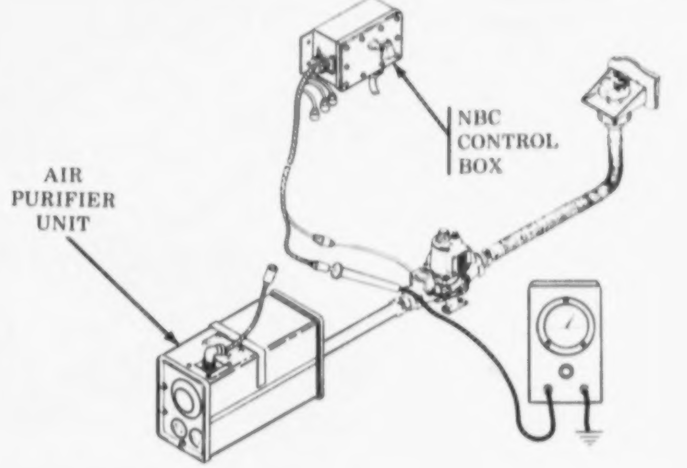


A Make sure spring clip is removed and air intake holes are not blocked.

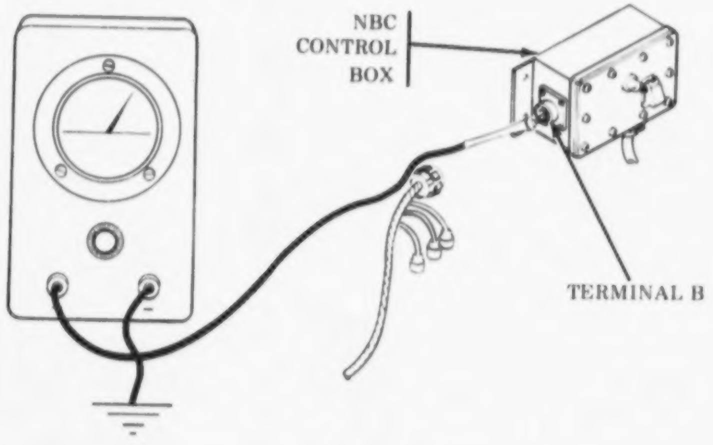
Check for pinched, blocked, damaged or disconnected air hoses. Replace damaged hoses. Eliminate any sharp bends in hoses to allow unrestricted air flow. Reconnect any disconnected hoses. If hoses are in good working condition, go to step B.

B Check for clogged particulate filter. Replace if necessary (p 14-3). If filter is in good working condition, go to step C.

TA310606

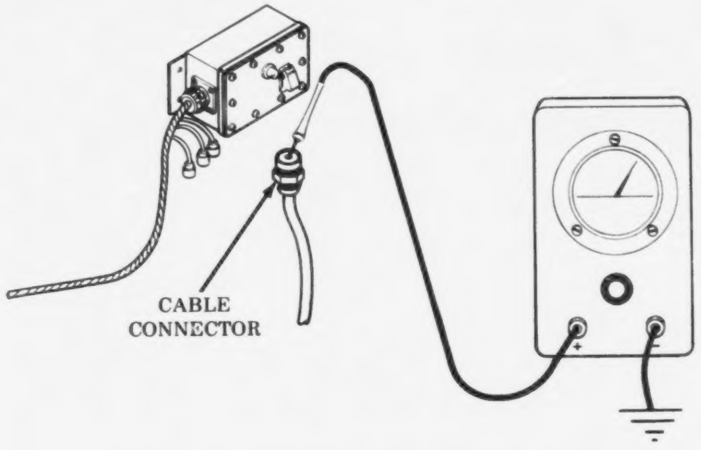


C Check for defective air purifier blower motor. If NBC power control box indicator light is lit when control switch is ON, set MASTER switch OFF and disconnect power cable lead 415 from air purifier unit. Place red probe from multimeter on lead terminal 415, and ground black lead for voltage check. Set MASTER switch ON. If voltage is indicated, replace air purifier unit (p 14-3). If no voltage is indicated, go to step D.

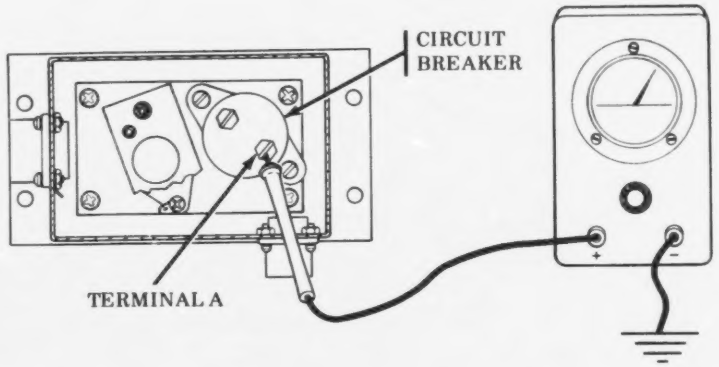


D Set MASTER switch OFF. Disconnect cable from NBC control box. Place red probe of multimeter on receptacle socket B, and ground black probe. Set MASTER switch and NBC control box ON. If voltage is indicated, repair or replace lead 415 between NBC control box and air purifier unit. If no voltage is indicated, go to step E.

TA310607

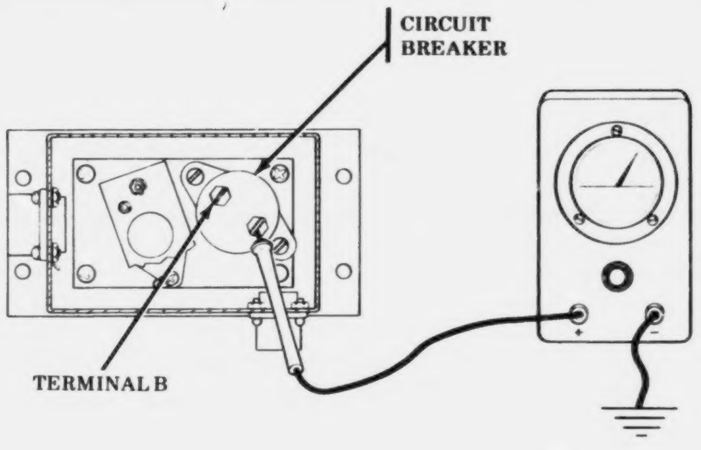


E Set MASTER switch OFF. Set NBC control box switch OFF. Disconnect power cable lead 415 at NBC control box. Place red probe of multimeter in cable connector, and ground black probe set MASTER switch ON and check voltage. If no voltage is indicated, cargo compartment wiring harness is defective, notify Support Maintenance. If voltage is indicated, go to step F.

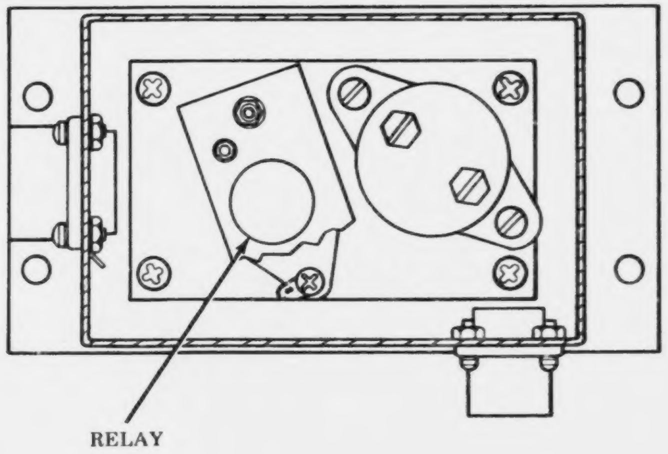


F Set MASTER switch OFF. Reconnect cables to NBC control box. Remove cover from control box (p 14-10). Place red probe of multimeter on terminal A of control box circuit breaker. Ground blac'· probe. Set MASTER switch ON. Meter should indicate voltage. If not, replace or repair box 415 receptacle (p 14-10). If voltage is indicated, go to step G.

TA310608

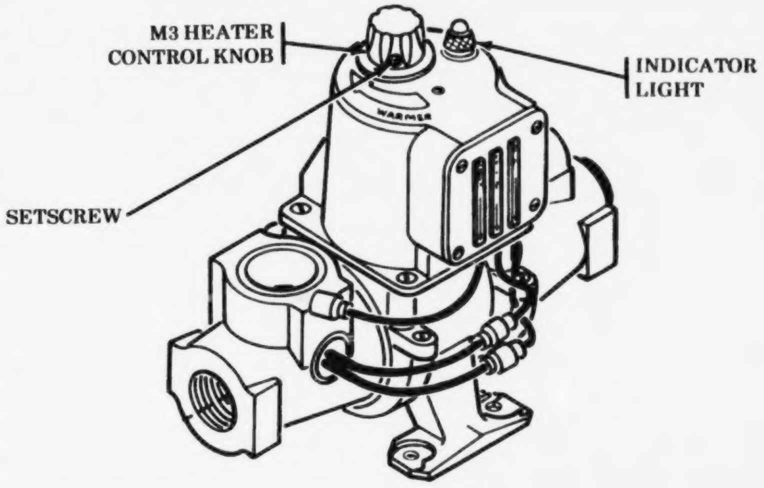


G Set MASTER switch OFF. Place red probe of multimeter on circuit breaker terminal B, and ground black probe. Set MASTER switch ON. If voltage is indicated, go to step H. If voltage is not indicated, replace circuit breaker (p 14-10).

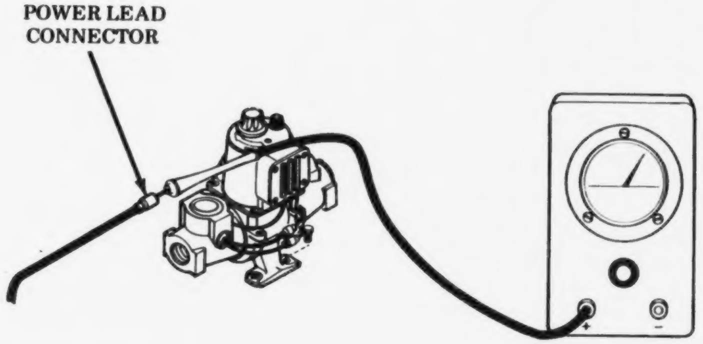


H Move NBC power control box switch ON and OFF, and listen for click indicating relay operation. If relay does not operate, check wiring to relay (p 14-10). If wiring is satisfactory, replace relay (p 14-10). Set MASTER switch OFF.

TA310609


M3 HEATER CONTROL KNOB
SETSCREW
INDICATOR LIGHT

I Set NBC control box switch ON. Turn M3 heater control knob clockwise. If control knob is loose, tighten setscrew. Indicator light should be lit. If no heat is produced, go to step J. Set NBC control box switch OFF.


POWER LEAD CONNECTOR
+
−

J Set MASTER switch OFF. Disconnect power lead from the M3 heater being checked. Place red probe of multimeter in power lead connector, and ground black lead. Set MASTER switch ON. Set NBC control box ON. If voltage is indicated, replace M3 heater unit (p 14-7). If no voltage is indicated, check continuity of power lead between NBC control box and M3 heater unit (p 6-109).

TA310610

AUXILIARY POWER UNIT	**ENGINE CRANKS BUT FAILS TO START**

START HERE

NOTE

Due to locations of APU and APU control box, some troubleshooting steps will require two persons.

1 Check fuel level gage. Fill fuel tanks if low or empty (TM 9-2350-267-10).

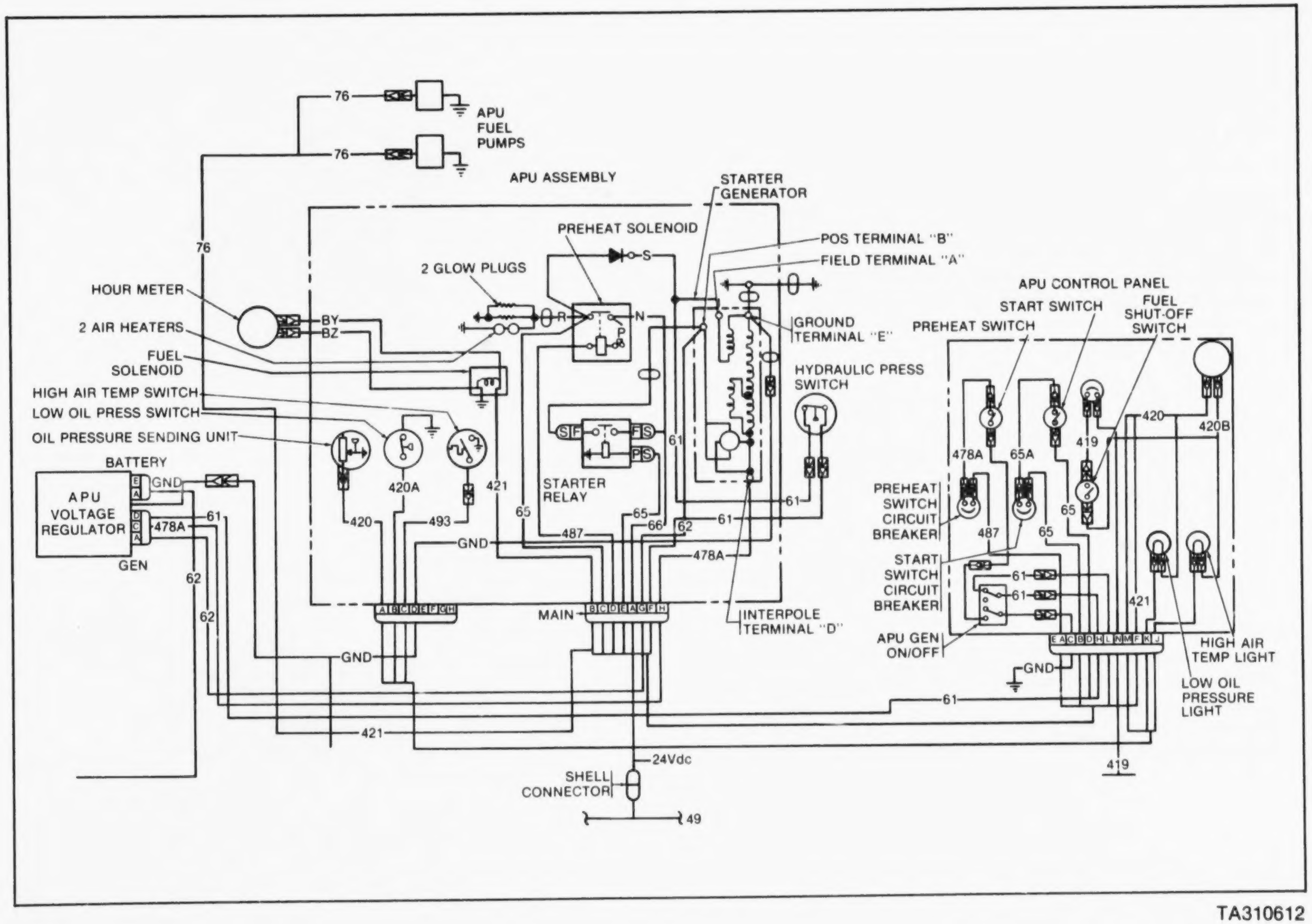
2 Check for restricted air intake, dirty or clogged air filters. Remove restrictions or replace filters (TM 9-2350-267-10).

3 Inspect fuel lines and fittings for leakage, restrictions or other damage. Repair or replace as required (p 13-25 thru 13-28).

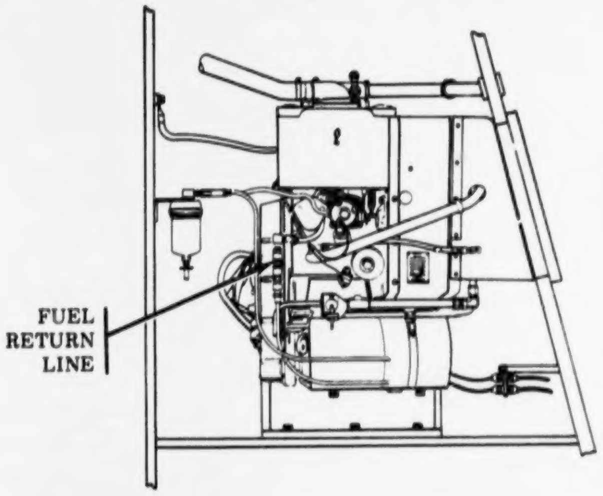
4 Open APU filter drain cocks and drain water and any contaminants from filter units (TM 9-2350-267-10).

5 Replace clogged or dirty fuel filters (p 13-16). If engine will not start, go to step A.

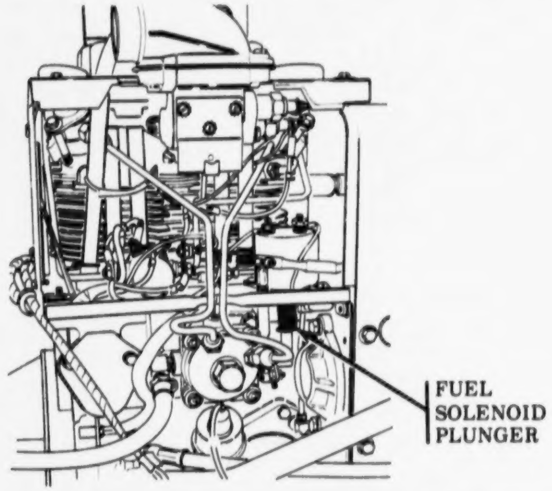
TA310611


APU FUEL PUMPS
76
APU ASSEMBLY
STARTER GENERATOR
PREHEAT SOLENOID
POS TERMINAL "B"
FIELD TERMINAL "A"
2 GLOW PLUGS
HOUR METER
2 AIR HEATERS
FUEL SOLENOID
HIGH AIR TEMP SWITCH
LOW OIL PRESS SWITCH
OIL PRESSURE SENDING UNIT
BATTERY
APU VOLTAGE REGULATOR
GEN
GND
BY
BZ
S
R
N
P
GROUND TERMINAL "E"
HYDRAULIC PRESS SWITCH
STARTER RELAY
SF
FS
PS
420A
420
493
421
65
66
62
61
487
478A
GND
MAIN
INTERPOLE TERMINAL "D"
APU CONTROL PANEL
START SWITCH
PREHEAT SWITCH
FUEL SHUT-OFF SWITCH
420B
419
65A
PREHEAT SWITCH CIRCUIT BREAKER
START SWITCH CIRCUIT BREAKER
APU GEN ON/OFF
HIGH AIR TEMP LIGHT
LOW OIL PRESSURE LIGHT
24Vdc
SHELL CONNECTOR
49

TA310612

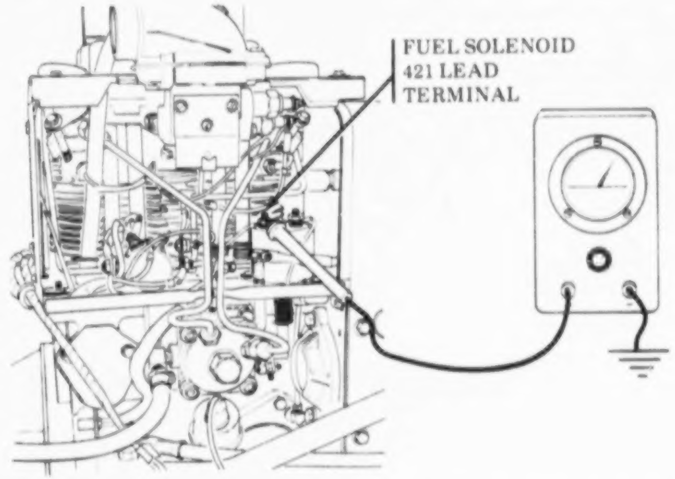


A Remove APU access plate (p 13-13). Disconnect fuel return line. Set MASTER switch ON. Set APU FUEL SHUT OFF switch ON. Place suitable container under engine-mounted disconnect fitting. Use screwdriver to push open disconnect valve; observe fuel flow. If fuel flow is observed, go to step B. If fuel does not flow, go to step E.

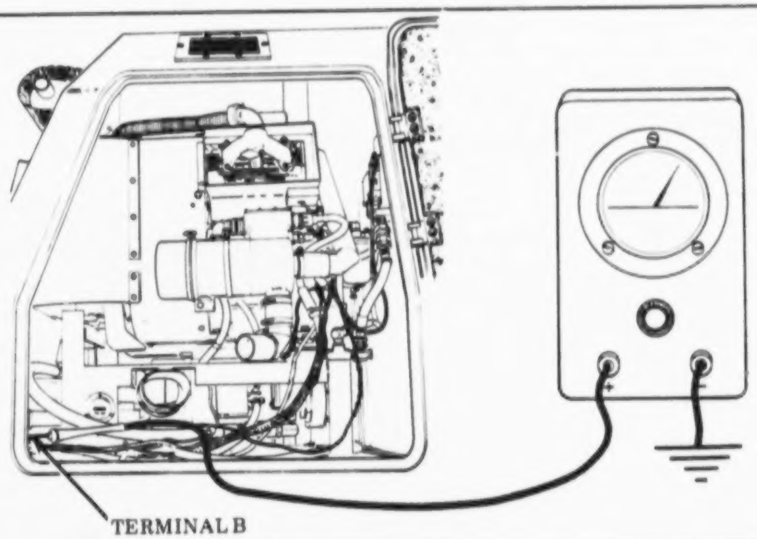


B Turn APU FUEL SHUT OFF switch ON and OFF while observing fuel solenoid plunger. Plunger should pull up when switch is turned ON, and move down when switch is turned OFF. If solenoid functions properly, notify Support Maintenance to troubleshoot APU. If solenoid does not function properly, go to step C.

TA310613

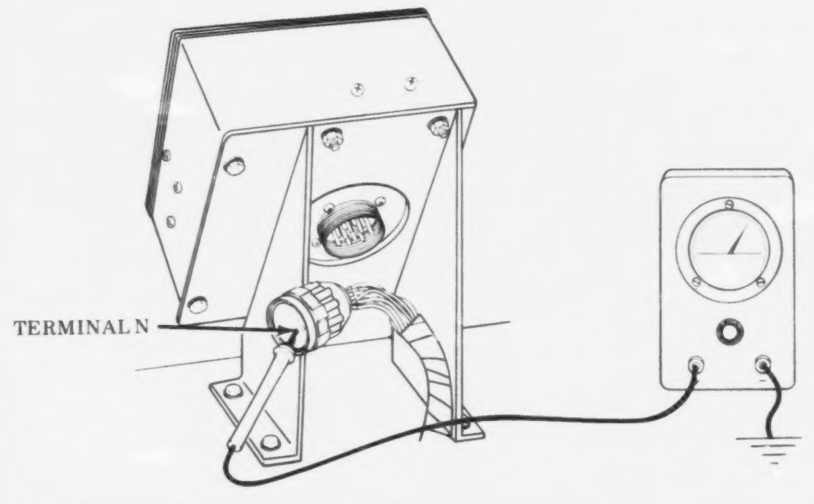


C Remove APU access panel from APU. Set MASTER switch OFF. Check voltage at fuel solenoid 421 lead terminal. Place red multimeter probe on 421 terminal and ground black probe. Set MASTER switch ON. Set APU FUEL SHUT OFF switch ON. If voltage is indicated, fuel solenoid is defective. Notify Support Maintenance. If no voltage is indicated, go to step D.

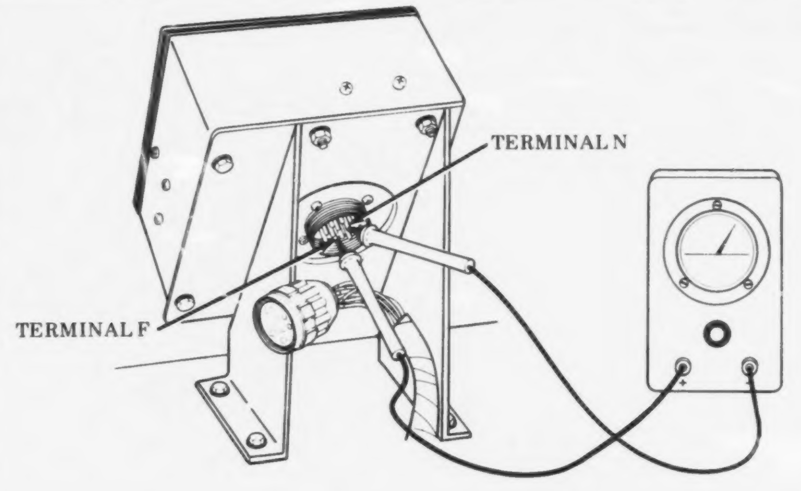


D Set MASTER switch OFF. Disconnect main harness connector (larger connector) at APU wall mount. Place red probe of multimeter on wall-mounted connector terminal B, and ground black probe. Set MASTER switch ON. Set FUEL SHUT OFF switch ON. If voltage is indicated, repair or replace harness lead 421 from wall-mounted connector to solenoid (p 6-132). If no voltage is indicated, go to step E. Reconnect main harness connector.

TA310614

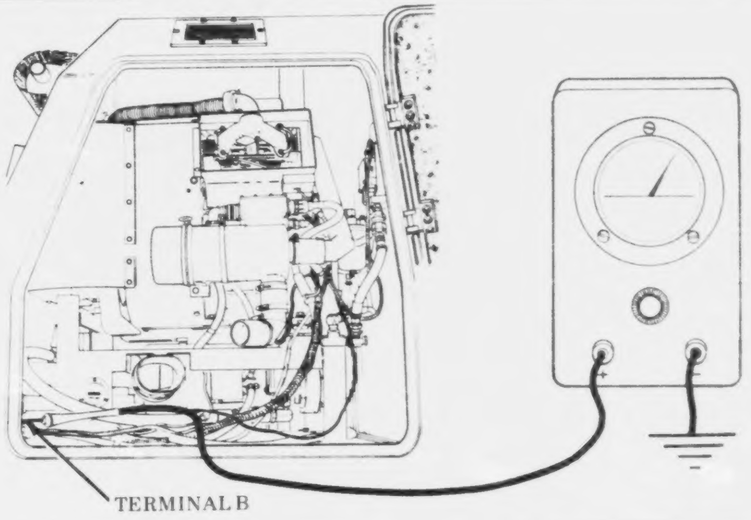


E Set MASTER switch OFF. Remove APU control box (p 13-35). Disconnect plug from APU control box. Check voltage by placing red multimeter probe on harness connector terminal socket N, and ground black probe. Set MASTER switch ON. If voltage is indicated, go to step F. If no voltage is indicated, main cargo compartment harness lead 419 to circuit breaker panel is defective. Notify Support Maintenance.

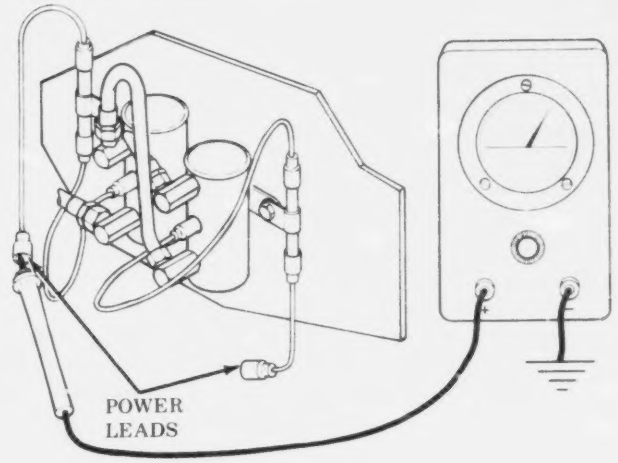


F Set MASTER switch OFF. Check APU control box FUEL SHUT OFF switch circuit continuity. Place multimeter red probe on control box receptacle terminal pin N, and place black probe on terminal pin F. Set FUEL SHUT OFF switch ON. Meter should indicate 0 ohms. If it does, go to step G. If meter remains on ∞ with switch ON, check continuity of panel FUEL SHUT OFF switch and circuit breaker (p 13-37). Replace or repair as required (p 13-35). Reinstall APU control panel (p 13-36).

TA310615



G Disconnect main harness connector at APU wall. Set MASTER switch ON. Check voltage by placing red multimeter probe on wall-mounted connector terminal pin B, and ground black probe. Set FUEL SHUT OFF switch ON. If no voltage is indicated, repair or replace harness lead 421 from APU wall-mounted connector to APU control panel (p 6-113). If voltage is indicated, go to step H. Reconnect main harness connector.



H Set MASTER switch OFF. Disconnect power leads from APU fuel pumps. Set MASTER switch ON. Check voltage of each lead by placing red multimeter probe in lead connector, and grounding black probe. Set FUEL SHUT OFF switch ON. If voltage is indicated and fuel pumps do not operate, replace fuel pumps (p 13-28). If no voltage is indicated, repair or replace lead 76 from fuel pumps to harness lead 421 (p 6-113). Reconnect power leads to APU fuel pumps.

TA310616

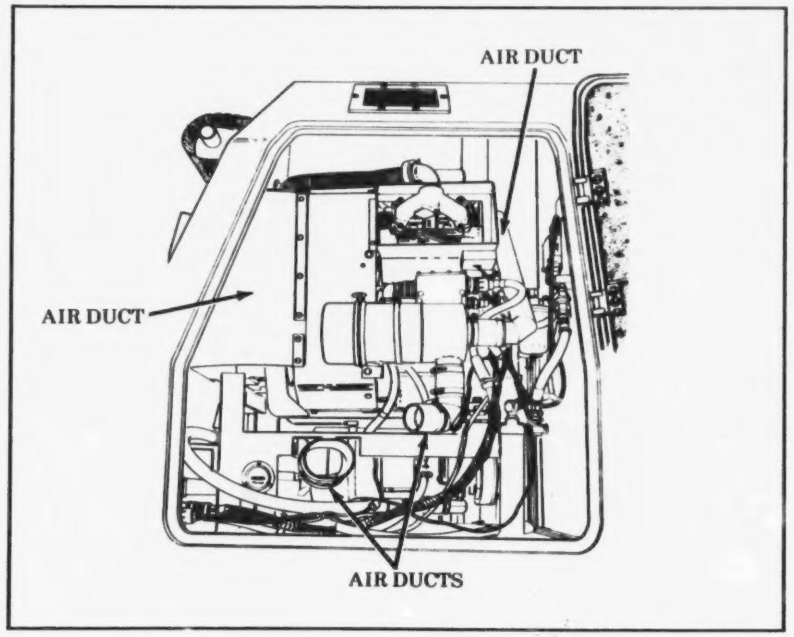
AUXILIARY POWER UNIT	ENGINE OVERHEATING

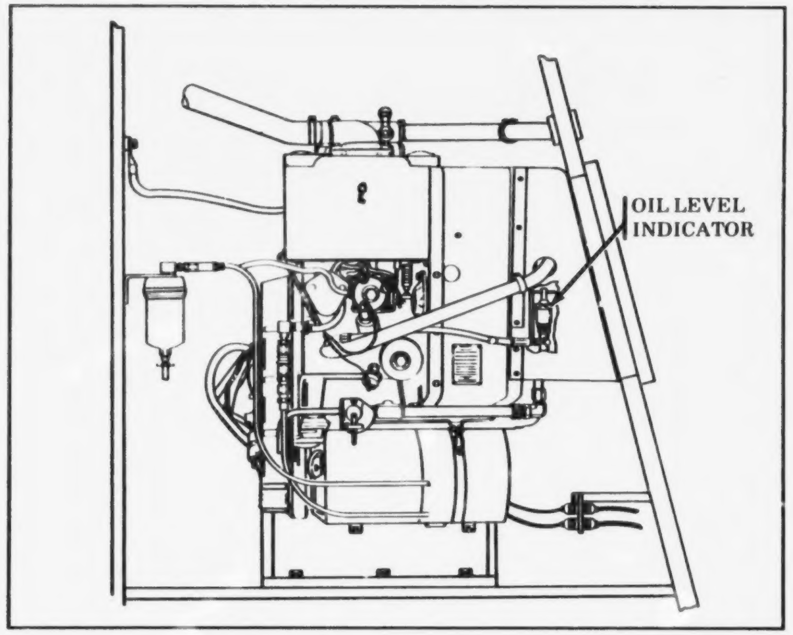
START HERE

1 Check that all air intake ducts and passages are free of obstructions. Clean or replace dirty air cleaner filter element (TM 9-2350-267-10).

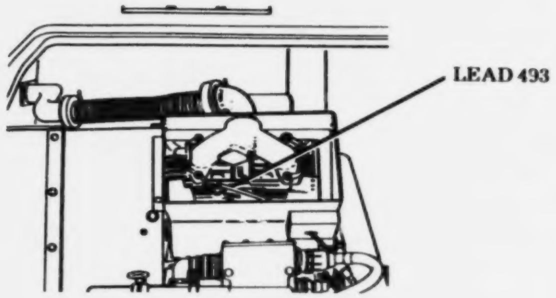
2 Check for low oil level. Refill if necessary (LO 9-2350-267-12).

3 If HIGH AIR TEMPerature light remains lit after engine cools, go to step A.

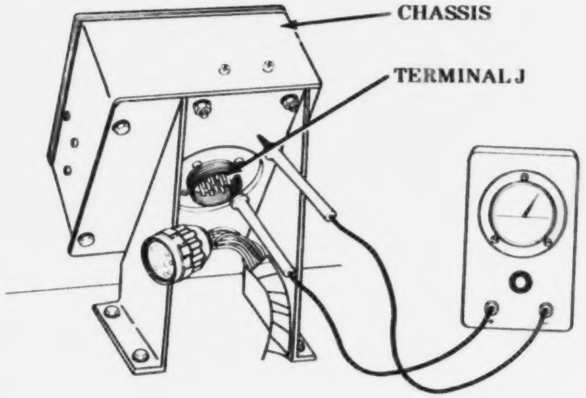

AIR DUCT
AIR DUCT
AIR DUCTS


OIL LEVEL INDICATOR

TA310617

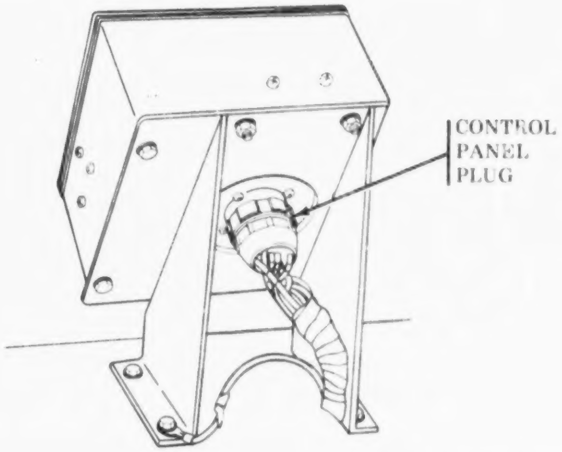


A If HIGH AIR TEMPerature light remains lit after engine cools, disconnect lead 493 from high air temperature switch on APU. If HIGH AIR TEMPerature light goes out, high air temperature switch is defective. Notify Support Maintenance. If light remains on after disconnecting lead, go to step B.



B Turn MASTER switch OFF. Remove APU control box (p 13-31). Disconnect APU control panel plug. Check for short to ground by placing red multimeter probe in panel connector terminal J, and ground black probe to control box chassis. If meter indicates 0 ohms, replace or repair HIGH AIR TEMPerature lamp socket (p 13-35). If meter remains on ∞, go to step C.

TA310618



C Reconnect APU control box panel plug. If HIGH AIR TEMPerature lamp is lit, repair or replace cable lead 493 (p 6-106).

AUXILIARY POWER UNIT	ENGINE STARTS BUT FAILS TO KEEP RUNNING

START HERE

A Check for dirty air cleaner filter element. Clean or replace filter element (TM 9-2350-267-10).

B Check APU engine fuel supply line for restriction or damage. Clean fuel line or replace, if necessary (p 13-25 thru 13-29).

C Replace fuel filter elements if dirty (p 13-16).

TA310619

AUXILIARY POWER UNIT	**ENGINE HARD TO START** **Do steps A through F.** **ENGINE HARD TO START IN COLD WEATHER** **Do steps E through F.**

START HERE

NOTE

Install winterization kit in extremely cold weather conditions, 0° to −65°F.

A Open fuel filter drain cocks to remove water and contaminants from filters.

B Check for dirty or clogged fuel filters. Replace fuel filter elements if dirty (p 13-13).

C Inspect for leaking APU fuel lines and fittings. Tighten or replace defective lines or fittings (p 13-25 thru 13-29).

D Check for dirty air cleaner filter element. Clean or replace filter element (TM 9-2350-267-10).

E Disconnect lead R to glow plugs and preheaters (p 6-133). Measure continuity from preheat relay terminal to glow plugs and preheaters. Meter should indicate 0 ohms. If not, replace or repair lead R from relay terminal to glow plugs and preheaters. If circuit R shows continuity, disconnect lead R from glow plug and measure resistance from each glow plug terminal to ground. The meter should indicate 4.75 ± 1.5 ohms for each glow plug. If not, applicable glow plug is defective; notify Support Maintenance. If it does, go to step F.

F Measure resistance from preheater plug terminal to preheat terminal. The meter should indicate 0.6 ± 0.05 ohms. If it does not, replace appropriate defective heater plug.

TA310620

AUXILIARY	ENGINE MISFIRES

START HERE

A Check for dirty air cleaner filter element. Clean or replace filter element (TM 9-2350-267-10).

B Check for dirty or clogged fuel filters. Replace fuel filter elements if necessary (p 13-16).

C Open fuel filter drain cocks to remove water and contaminants from filters.

D Inspect APU fuel lines and fittings for leaks. Tighten or replace defective lines or fittings (p 13-25 thru 13-29).

E If fuel contamination is suspected, drain fuel tanks and refill with new fuel (TM 9-2350-267-10).

F Disconnect fuel return line at injection pump quick-disconnect. Use screwdriver to push open disconnect valve. Operate fuel pumps and bleed fuel into suitable container to remove any air in the fuel system.

G If fuel flow is not steady or is weak, check fuel lines for obstructions or restrictions. Repair or replace as required (p 13-25 thru 13-29).

Use screwdriver to push open disconnect valve; operate fuel pumps and bleed fuel into suitable container to remove any air in the fuel system.

TA310621

AUXILIARY POWER UNIT	**ENGINE LACKS POWER**

START HERE

A Check for dirty air cleaner filter element. Clean or replace filter element (TM 9-2350-267-10).

B Remove any obstructions found in air intake ducting.

C If fuel contamination is suspected, drain fuel tanks and refill with new fuel (TM 9-2350-267-10).

D Check for dirty or clogged fuel filters. Replace fuel filter elements if necessary (p 13-16).

TA310622

AUXILIARY POWER UNIT	**GENERATOR CHARGING SYSTEM INDICATOR READS IN YELLOW OR RED REGIONS WITH APU OPERATING AND APU GENERATOR SWITCH ON**

NOTE

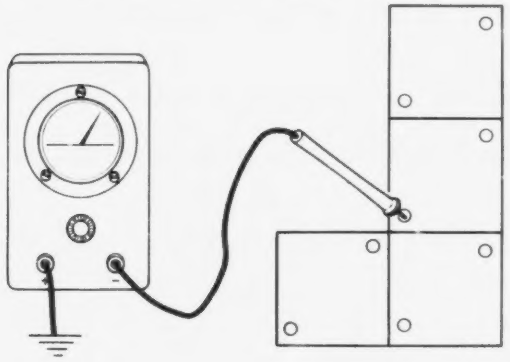
Portable instrument panel battery indications (approximate):

23.5 ± 1 Vdc - mid-yellow
26 ± Vdc - mid-scale (gage)
28 ± Vdc - mid-green

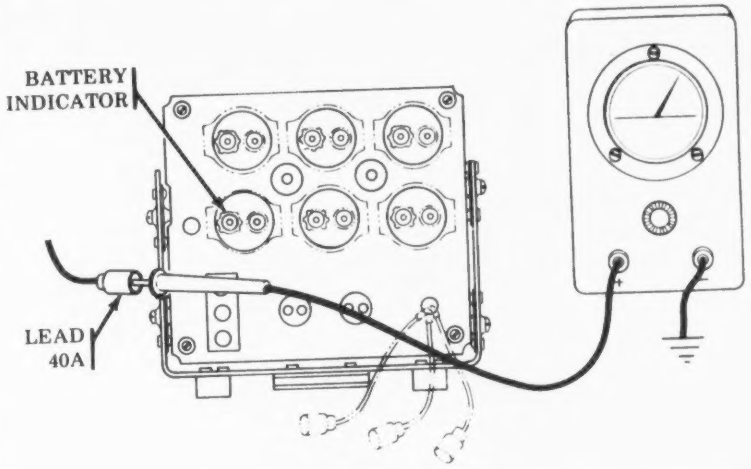
A Operate APU. Set APU GENerator switch ON (TM 9-2350-267-10).

START HERE

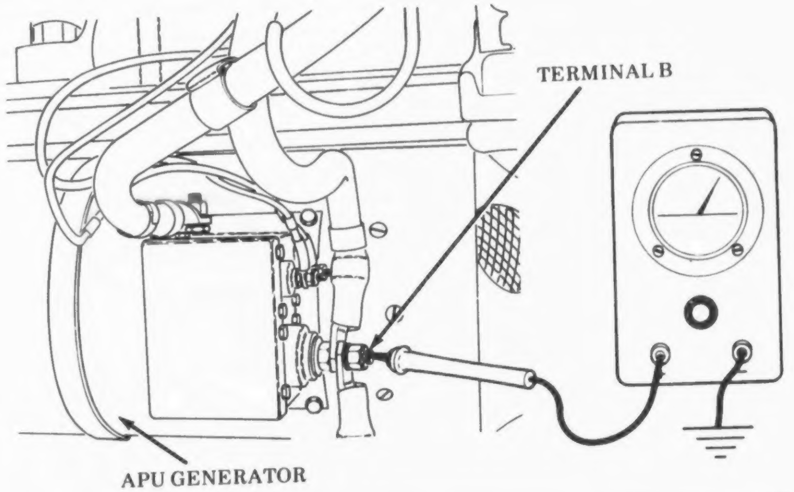
B Place red multimeter probe on battery positive terminal 62/81 and ground black probe. Meter should indicate nominal 24 vdc. If correct voltage is indicated, turn MASTER switch OFF and go to step C. If incorrect voltage is indicated, go to step D.



TA310623



C Remove portable instrument panel from cover, but do not disconnect harness or leads (p 6-21). Disconnect lead 40A from battery indicator. Check voltage by placing red multimeter probe in lead 40A connector and ground black probe. Turn MASTER switch ON. Meter should indicate nominal 24 vdc. If voltage is correct, replace indicator (p 6-21). If not, troubleshoot portable panel circuitry (Appx F).

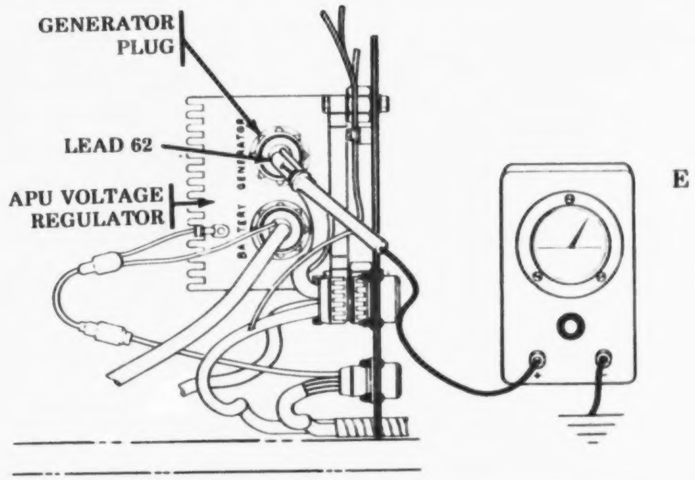


NOTE

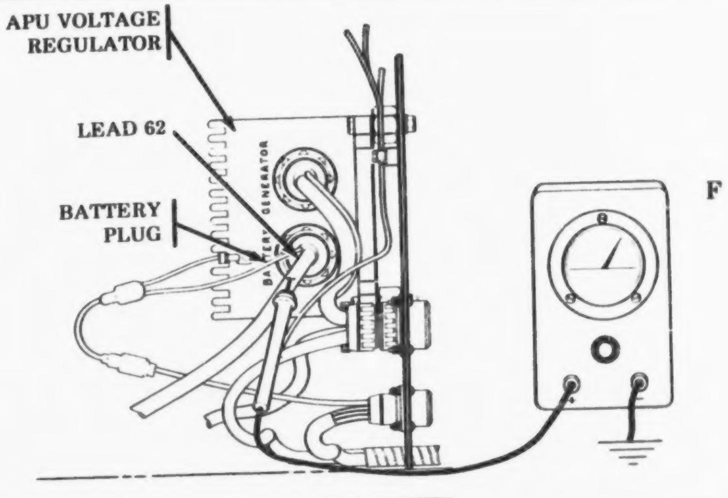
To gain access to APU generator, remove air intake plenum (p 13-2).

D With APU operating and APU GENerator switch ON, place red multimeter probe on terminal B of APU generator, and ground black probe. Meter should indicate 28 ± 0.7 vdc. If correct voltage is indicated, go to step E. If incorrect voltage is indicated, go to step G.

TA310624

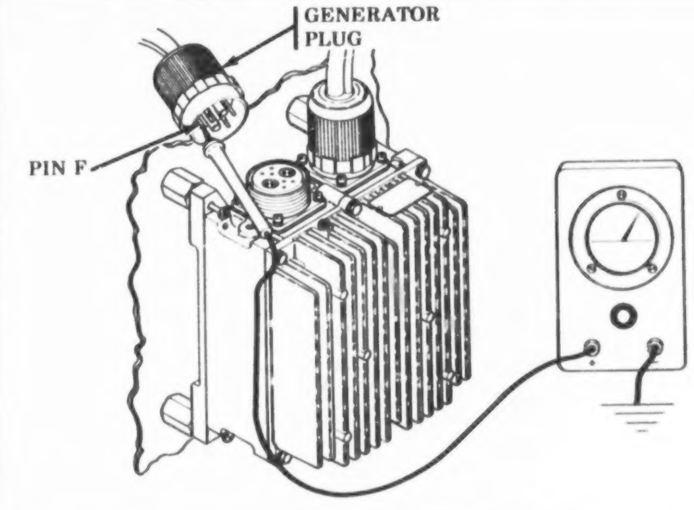

GENERATOR PLUG
LEAD 62
APU VOLTAGE REGULATOR
GENERATOR
BATTERY

E Use red multimeter probe, and probe through insulation of lead 62 of generator plug of APU voltage regulator. Ground black probe. Meter should indicate 28 ± 0.7 vdc. If not, repair or replace lead 62 from APU voltage regulator to APU generator (p 6-113). If voltage is correct, go to step F.

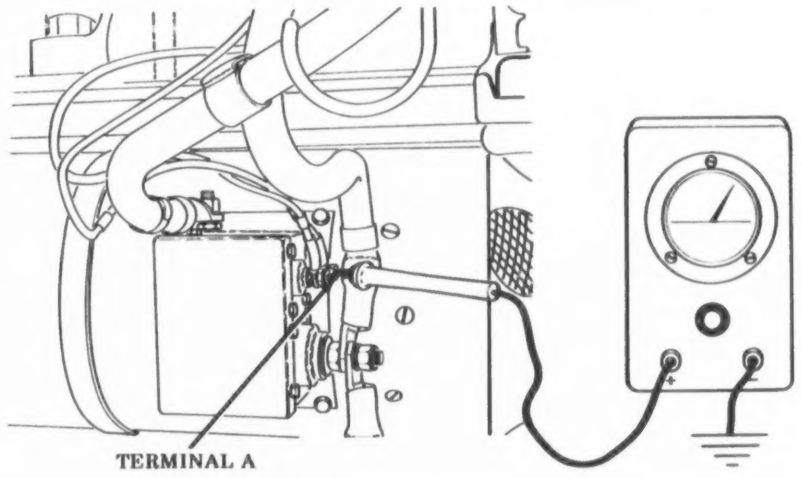

APU VOLTAGE REGULATOR
LEAD 62
BATTERY PLUG
GENERATOR
BATTERY

F Use red multimeter probe and probe through insulation of lead 62 of battery plug of APU voltage regulator. Ground black probe. Meter should indicate 24-28 vdc. If not, replace voltage regulator (p 6-50). If correct voltage is indicated, repair or replace lead 62 from APU voltage regulator to batteries (p 6-118 and 6-120).

TA310625

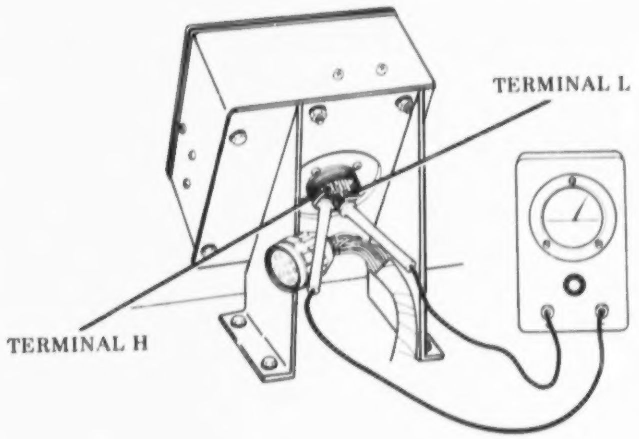


G Shut off APU. Set MASTER switch OFF. Disconnect generator plug from APU voltage regulator. Set APU GENerator switch ON. Measure resistance from pin F of plug to ground. Resistance should be approximately 2 ohms. If correct resistance is indicated, go to step J. If incorrect resistance is indicated, go to step H.

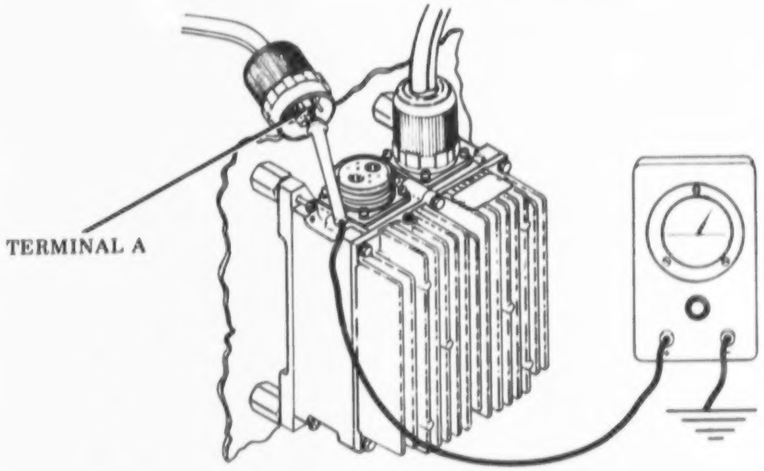


H Measure resistance of APU generator field terminal A to ground. Resistance should be approximately 2 ohms. If not, replace APU generator (p 13-19). If resistance is correct, go to step I.

TA310626



I Remove APU control box (p 13-35). Disconnect APU control box plug. Check continuity by replacing multimeter red probe on receptacle terminal H, and black probe on terminal L. Set APU GENerator switch ON. Meter should indicate 0 ohms. If not, troubleshoot generator switch and associated wiring (p 13-35). Repair or replace defective components. If 0 ohms is indicated, repair or replace defective components. If 0 ohms is indicated, repair or replace circuit 61 wiring between APU voltage regulator and APU generator (p 6-113).

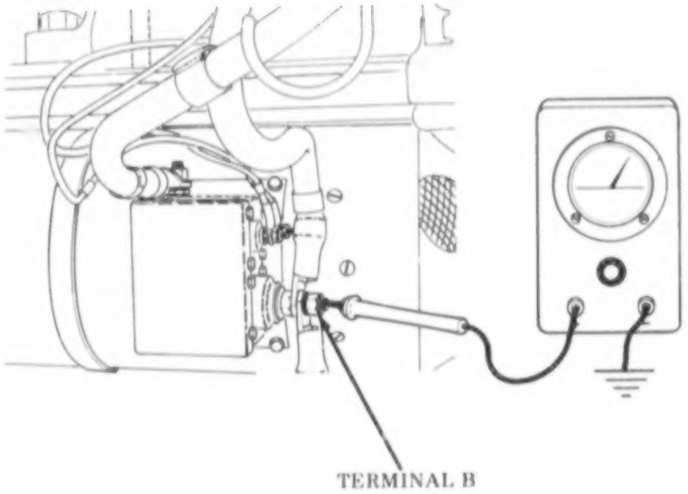


NOTE

Make sure APU GENerator switch is OFF before doing procedure J.

J Set MASTER switch ON. Start APU. Measure voltage by placing red multimeter probe on voltage regulator generator harness plug terminal A, and ground black probe. Meter should indicate 2 ± 1.5 vdc. If correct voltage is indicated, replace voltage regulator (p 6-50). If incorrect voltage is indicated, go to step K.

TA310627



NOTE

Operate APU with APU control box GENerator switch OFF.

K Check voltage by placing red multimeter probe on APU generator terminal B and ground black probe. Meter should indicate 2 ± 1.5 vdc. If correct voltage is indicated, troubleshoot circuit 62 wiring from APU generator to APU voltage regulator and repair or replace defective wiring or components (p 6-106). If incorrect voltage is indicated, replace APU generator (p 13-19).

TA310628

AUXILIARY POWER UNIT	**ENGINE FAILS TO CRANK WHEN STARTING SWITCH IS OPERATED**

NOTES

Due to locations of APU and APU control box, some troubleshooting steps will require two persons.

In cold weather situations, drain oil from engine and refill with proper grade of oil (LO 9-2350-267-12).

For test, APU control panel PREHEAT and STARTER switches must be held ON and GENerator switch turned OFF.

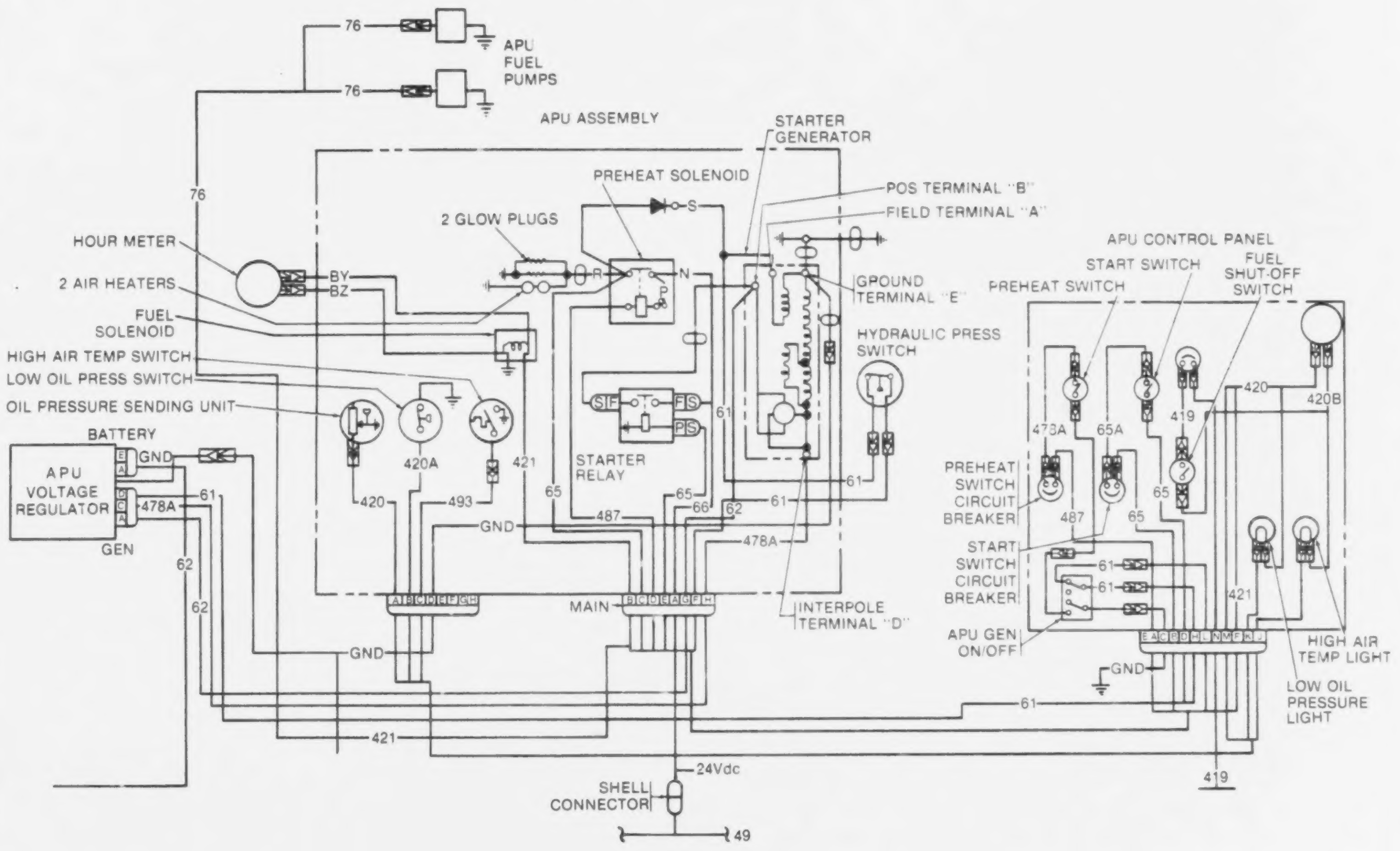
START HERE

1 Check batteries for loose connections, low electrolyte level, low or no charge (p 2-15). Charge (TM 9-6140-200-14) or replace batteries as required (p 6-44).

2 Remove APU access plate (p 13-13). Open APU compartment door.

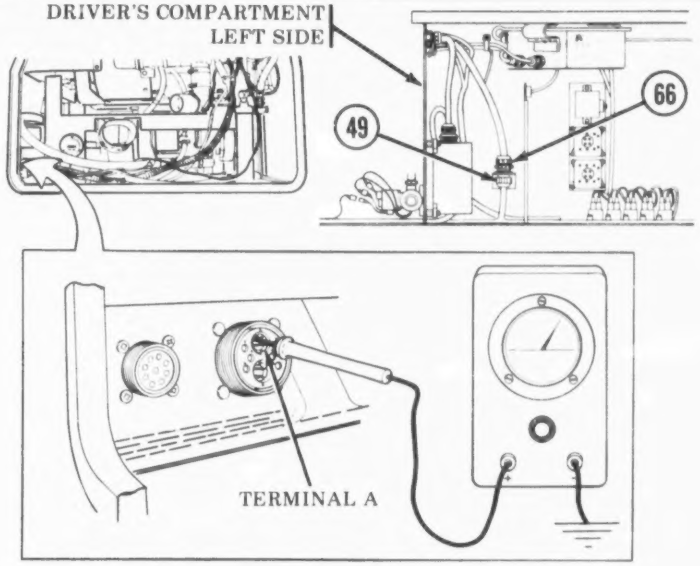
3 Visually check APU wires and wire connections. Replace, reconnect or tighten terminals as needed. If engine still does not crank, turn MASTER switch OFF and go to step A.

TA310629


APU FUEL PUMPS
76
APU ASSEMBLY
STARTER GENERATOR
PREHEAT SOLENOID
POS TERMINAL "B"
FIELD TERMINAL "A"
2 GLOW PLUGS
HOUR METER
2 AIR HEATERS
FUEL SOLENOID
HIGH AIR TEMP SWITCH
LOW OIL PRESS SWITCH
OIL PRESSURE SENDING UNIT
BATTERY
APU VOLTAGE REGULATOR
GEN
GND
478A
61
62
BY
BZ
R
N
S
P
GROUND TERMINAL "E"
HYDRAULIC PRESS SWITCH
S/F
F/S
P/S
STARTER RELAY
420
420A
493
421
65
66
487
MAIN
INTERPOLE TERMINAL "D"
APU CONTROL PANEL
START SWITCH
PREHEAT SWITCH
FUEL SHUT-OFF SWITCH
420B
419
473A
65A
PREHEAT SWITCH CIRCUIT BREAKER
START SWITCH CIRCUIT BREAKER
APU GEN ON/OFF
HIGH AIR TEMP LIGHT
LOW OIL PRESSURE LIGHT
24Vdc
SHELL CONNECTOR
49

ELECTRICAL DIAGRAM

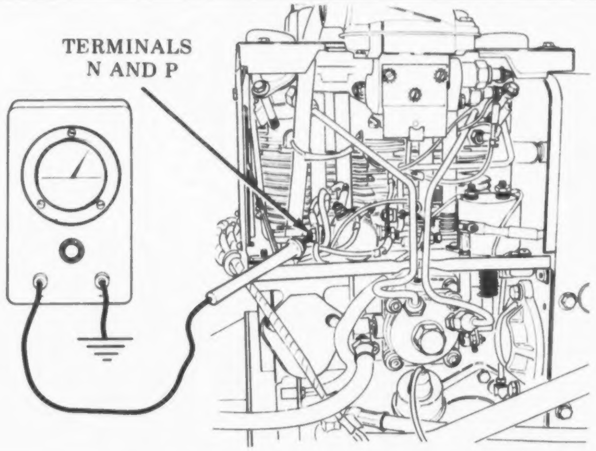
TA310630



A Disconnect main harness connector from APU wall-mounted receptacle. Place multimeter red probe on terminal A of receptacle, and ground black probe. Set MASTER switch ON. Check for voltage. If voltage is indicated, go to step B. If no voltage is indicated, check voltage at harness 12330248 lead 66 and harness 12330257 lead 49 shell connection. If voltage is indicated, repair or replace harness lead 66 to APU wall-mounted receptacle (p 6-113). If no voltage is indicated, troubleshoot main power harness (Appx F and p 6-77).

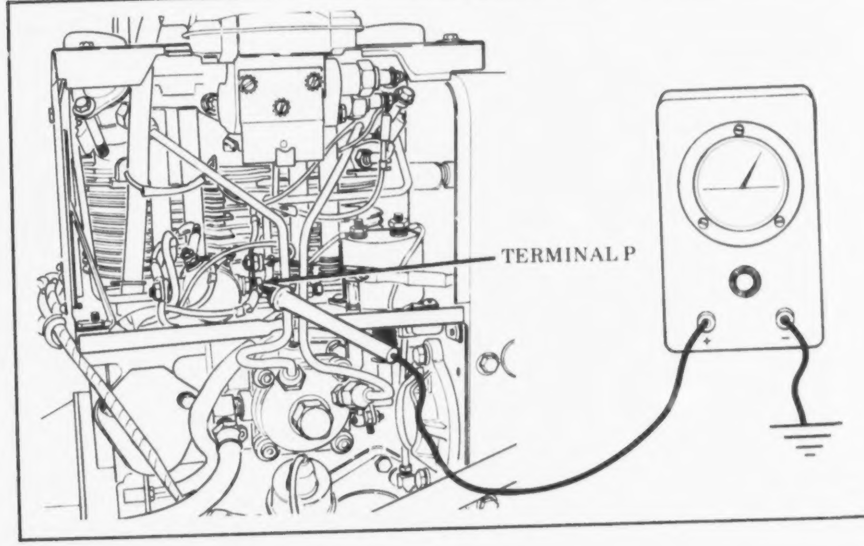
NOTE

If main cargo compartment wiring harness (12330252) is defective, notify Support Maintenance.

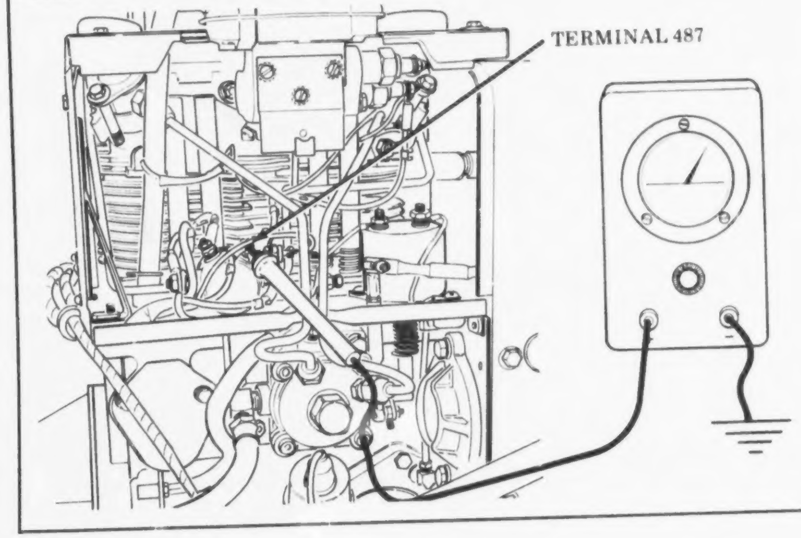


B Set MASTER switch OFF. Reconnect main harness connector to APU wall-mounted receptacle. Remove APU engine door panel. Place multimeter red probe on terminals N and P, ground black probe. Set MASTER switch ON. If voltage is indicated, go to step C. If no voltage is indicated, repair or replace lead N (p 6-132).

TA310631

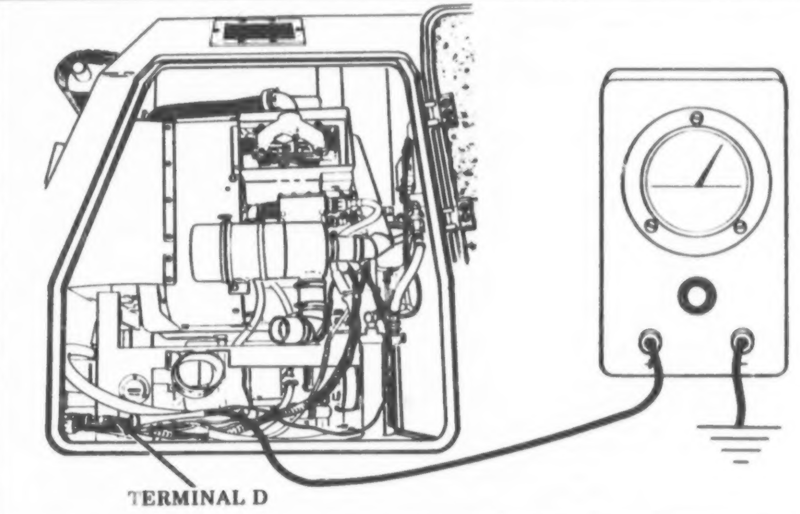


C Place multimeter red probe on terminal P and ground black probe. If voltage is indicated, go to step D. If no voltage is indicated, repair or replace lead P.

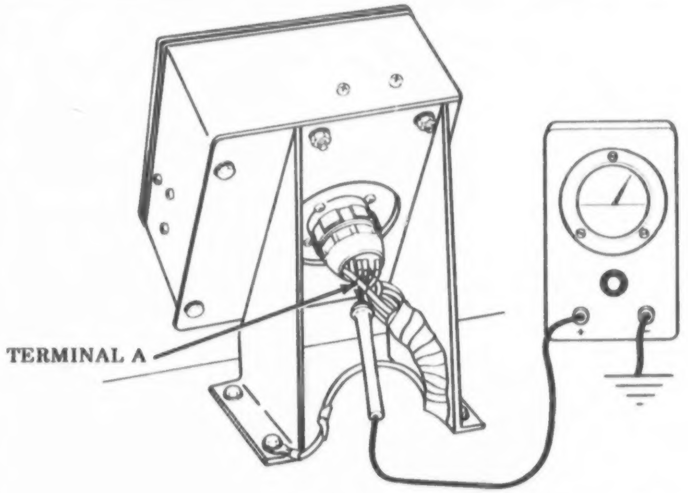


D Place multimeter red probe on terminal 487; ground black probe. If voltage is indicated, go to step E. If no voltage is indicated, preheat solenoid is defective; notify Support Maintenance.

TA310632

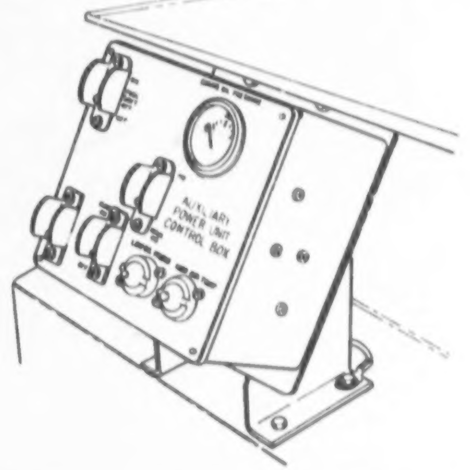


E Set MASTER switch OFF. Locate terminal D, lead 487, in APU harness plug. Probe through insulation of lead 487 wire with multimeter red probe; ground black probe. Set MASTER switch ON. If voltage is indicated, go to step F. If no voltage is indicated, repair or replace lead 487 from preheat solenoid terminal 487 to APU harness plug (p 6-132).

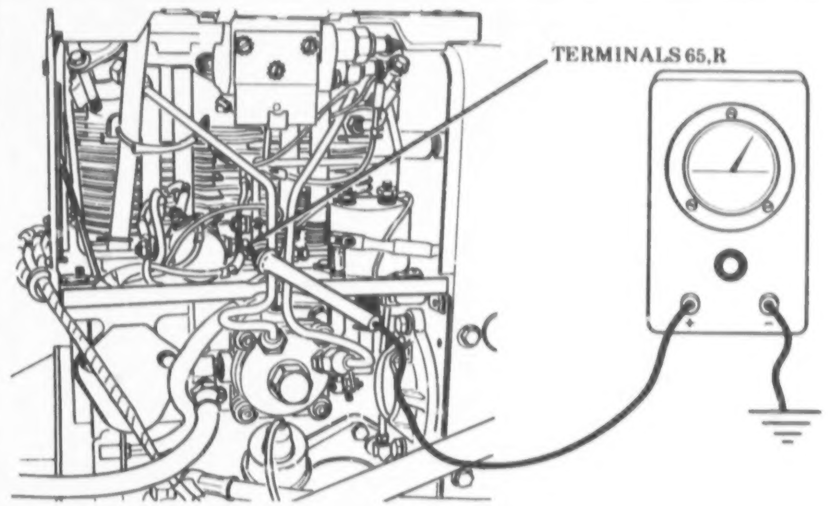


F Set MASTER switch OFF. Remove APU control box (p 13-35). but do not disconnect control box harness. Locate APU control box connector lead 487 terminal A. Probe through insulation of terminal A wire 487 with multimeter red probe; ground black probe. Set MASTER switch ON. If voltage is indicated, go to step G. If no volage is indicated, repair or replace harness lead 487 from APU compartment connector to APU control box (p 6-113).

TA310633

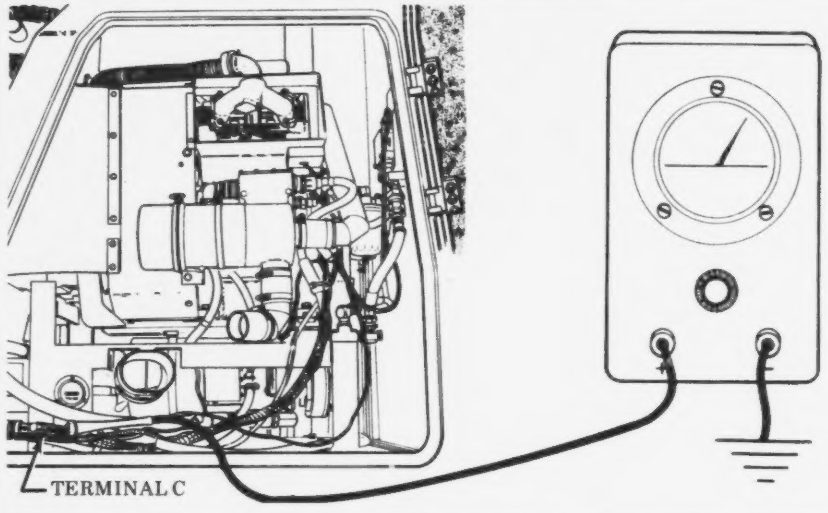


G Set MASTER switch OFF. Conduct APU control box continuity test (p 13-39). Repair or replace any APU control box defective wiring or components. If APU control box is working properly and APU still will not crank, go to step H.

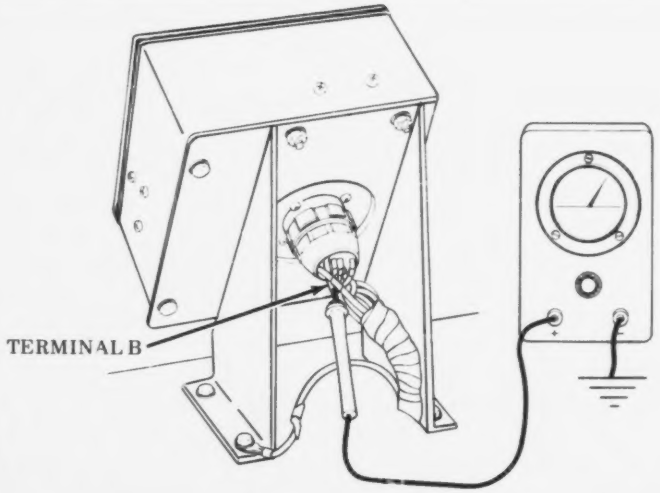


H Reconnect APU control box connector. Set MASTER switch ON. Hold PREHEAT control switch ON. Check voltage by placing multimeter red probe on preheat solenoid terminal 65 and R and grounding black probe. If voltage is indicated, go to step I. If no voltage is indicated, preheat solenoid is defective. Notify Support Maintenance.

TA310634



I Set MASTER switch OFF. Locate terminal C, lead 65, in APU main harness plug. Probe through insulation of terminal lead 65 wire with multimeter red probe; ground black probe. Set MASTER switch ON. Set APU GENerator switch OFF, PREHEAT switch ON. If voltage is indicated, go to step J. If no voltage is indicated, repair or replace lead 65 from preheat solenoid to harness plug (p 6-132).



J Set MASTER switch OFF. Locate APU control box harness lead 65 (to harness connector terminal B). Probe through insulation of terminal B, wire 65, with multimeter red probe; ground black probe. Set MASTER switch ON. Set APU GENerator switch OFF. Hold PREHEAT switch ON. If voltage is indicated, go to step K. If no voltage is indicated, repair or replace lead 65 between APU connector receptacle terminal C and APU control box plug, terminal B.

TA310635

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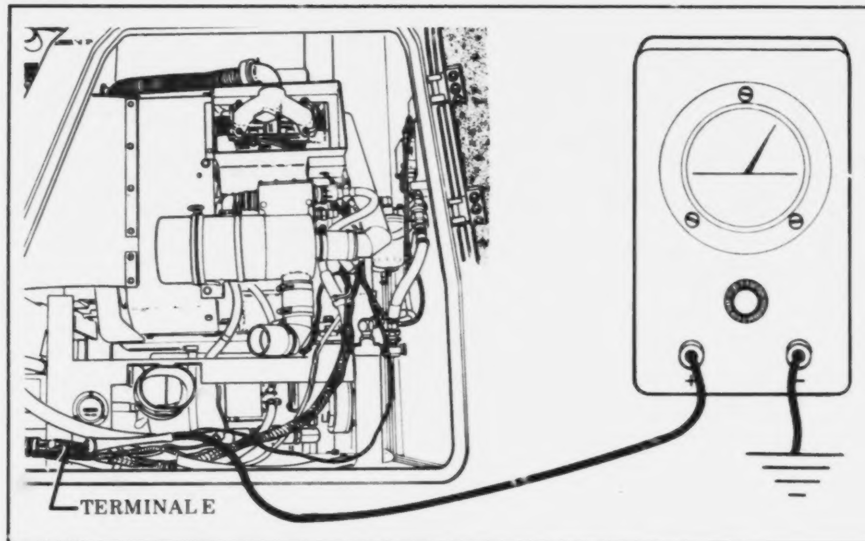
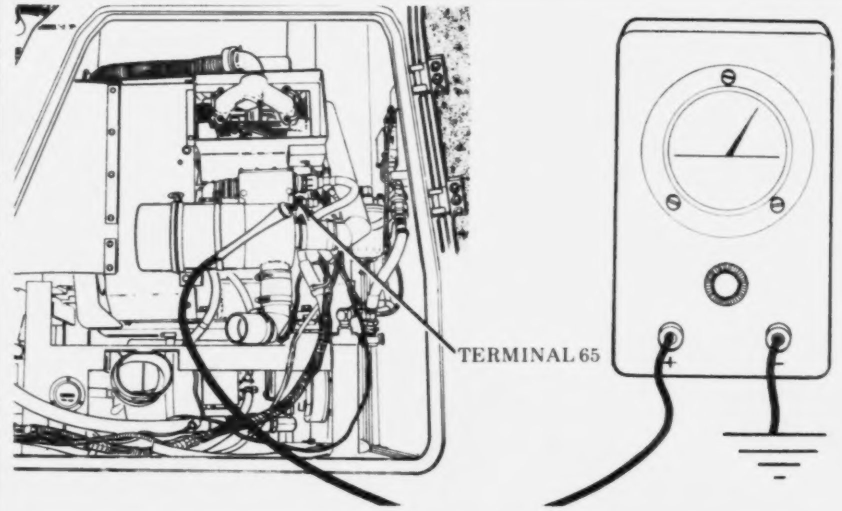
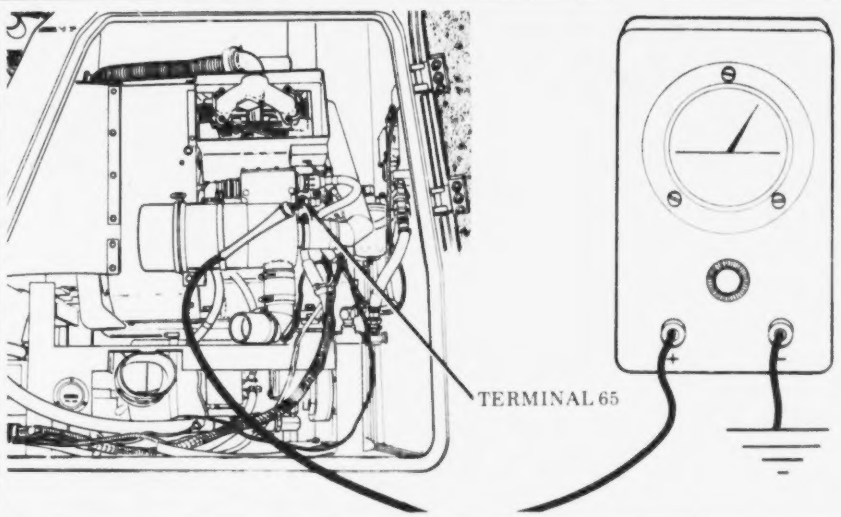


K Set MASTER switch OFF. Locate terminal E lead 65, in APU compartment main harness plug. Probe through insulation of terminal E lead 65 wire with multimeter red probe; ground black probe. Set MASTER switch ON. Set APU GENerator switch ON. Hold PREHEAT and START switches ON. If voltage is indicated, go to step L. If no voltage is indicated, repair or replace main harness lead 65 between APU compartment receptacle and APU control box plug (p 6-113).

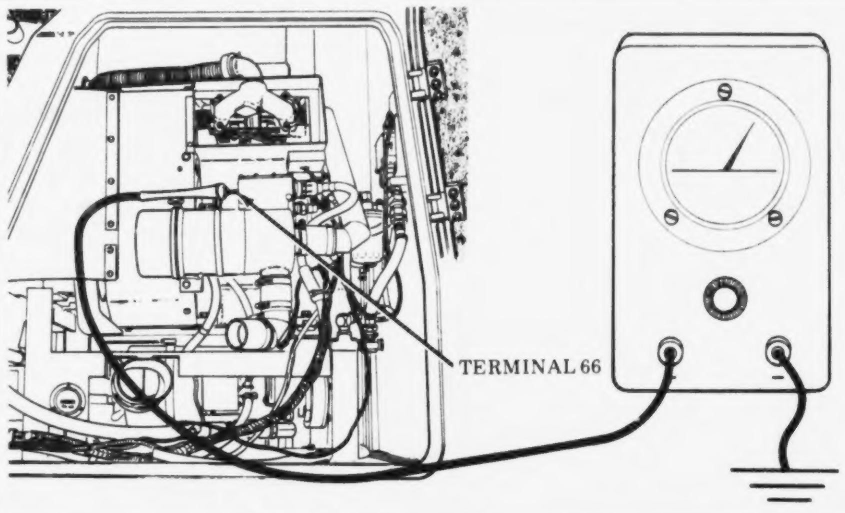


L Set MASTER switch OFF. Disconnect lead 65 from starter relay. Place multimeter red probe in lead 65 connector and ground black probe. Set MASTER switch ON. Hold PREHEAT and START switch ON. If voltage is indicated, replace starter relay (p 6-49). If no voltage is indicated, repair or replace lead 65 from relay to main APU compartment connector (p 6-132). If engine still does not crank, go to step M.

TA310636

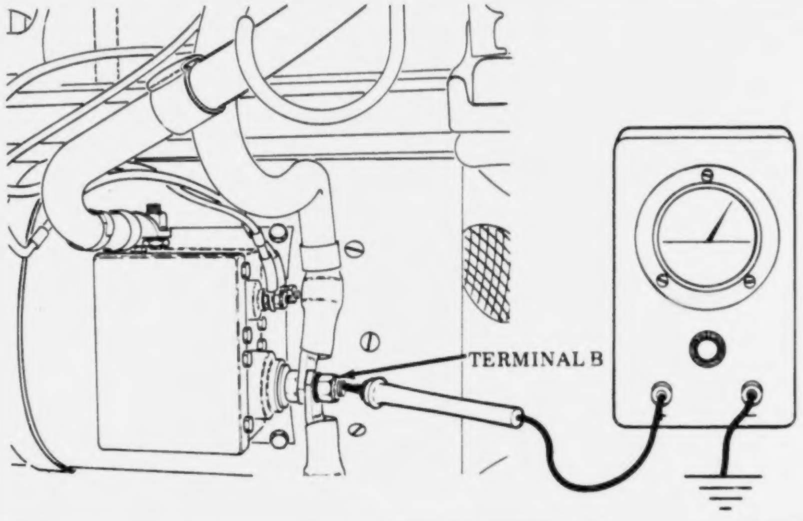


M Set MASTER switch OFF. Reconnect lead 65 connector to starter relay. Disconnect lead 66 plug. Place multimeter red probe in lead 66 plug and ground black probe. Set MASTER switch ON. If voltage is not indicated, repair or replace APU harness lead 66 from harness plug to starter relay (p 6-132). If voltage is indicated go to step N.

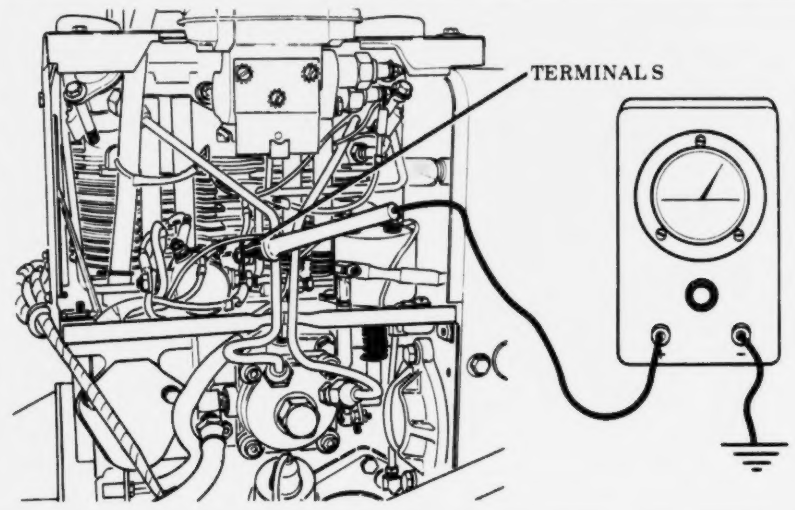


N Set MASTER switch OFF. Reconnect harness lead 66 to APU starter relay. Disconnect opposite lead 66 from relay. Place red multimeter probe in relay 66 receptacle and ground black probe. Hold PREHEAT and START switches ON. Set MASTER switch ON. If voltage is indicated, go to step O. If no voltage is indicated, replace starter relay (p 6-49).

TA310637

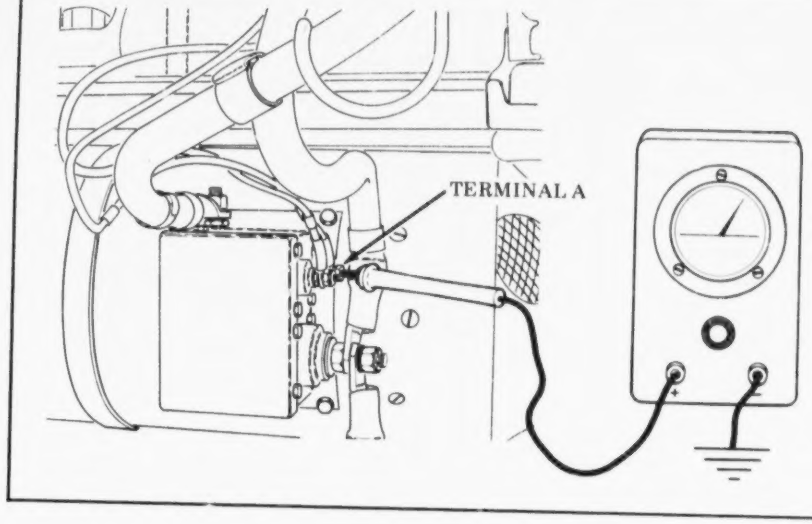


O Set MASTER switch OFF. Reconnect lead 66 to starter relay. Place red multimeter probe on terminal B of APU generator and ground black probe. Set MASTER switch ON. Hold PREHEAT and START switches ON. If voltage is indicated, go to step P. If no voltage is indicated, repair or replace lead 66 between APU starter relay and generator terminal B (p 6-138).

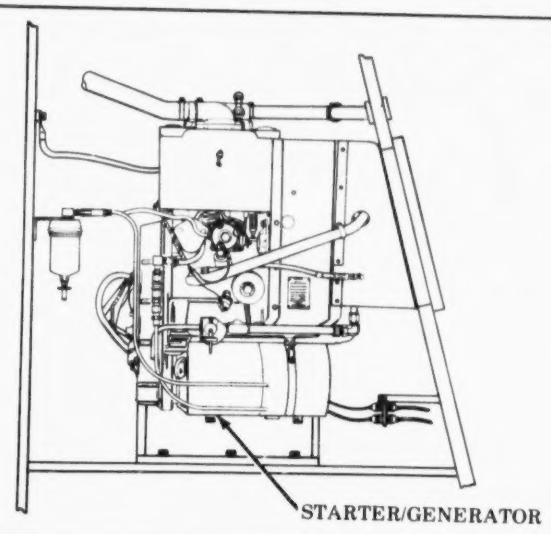


P Set MASTER switch OFF. Place red multimeter probe on lead S terminal at preheat solenoid mounted diode. Set MASTER switch ON. Hold PREHEAT and START switches ON. If voltage is indicated, go to step Q. If no voltage is indicated, replace diode (p 6-48).

TA310638



Q Set MASTER switch OFF. Place red multimeter probe on generator terminal A and ground black probe. Set MASTER switch ON. Hold PREHEAT and STARTER switches ON. If voltage is indicated, go to step R. If no voltage is indicated, repair or replace lead S between generator terminal A and diode (p 6-132). Set MASTER switch OFF.



R Make sure ground leads are secure. If engine still does not crank, replace starter/generator (p 13-19).

TA310639

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM FIRE DETECTION TEST AND ALARM PANEL INDICATORS (EFFECTIVE FOR VEHICLES 1 THRU 344)

POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON
Do steps A thru Q

FAULT LAMP REMAINS ON
Go to step R

START HERE

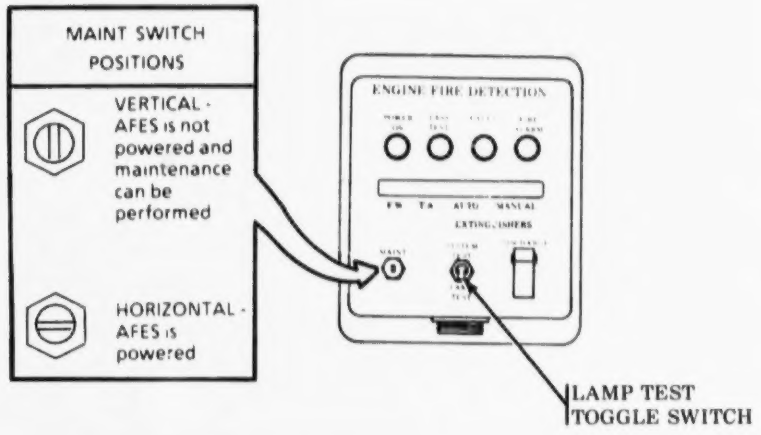
Before troubleshooting AFES, check the following:

1 Make sure MASTER switch is ON.

2 Make sure engine T/A panel MAINTenance switch is turned to horizontal position.

NOTE

Use flat-tip screwdriver to rotate MAINTenance switch.


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
FW
T/A
AUTO
MANUAL
EXTINGUISHERS
MAINT
LAMP TEST TOGGLE SWITCH

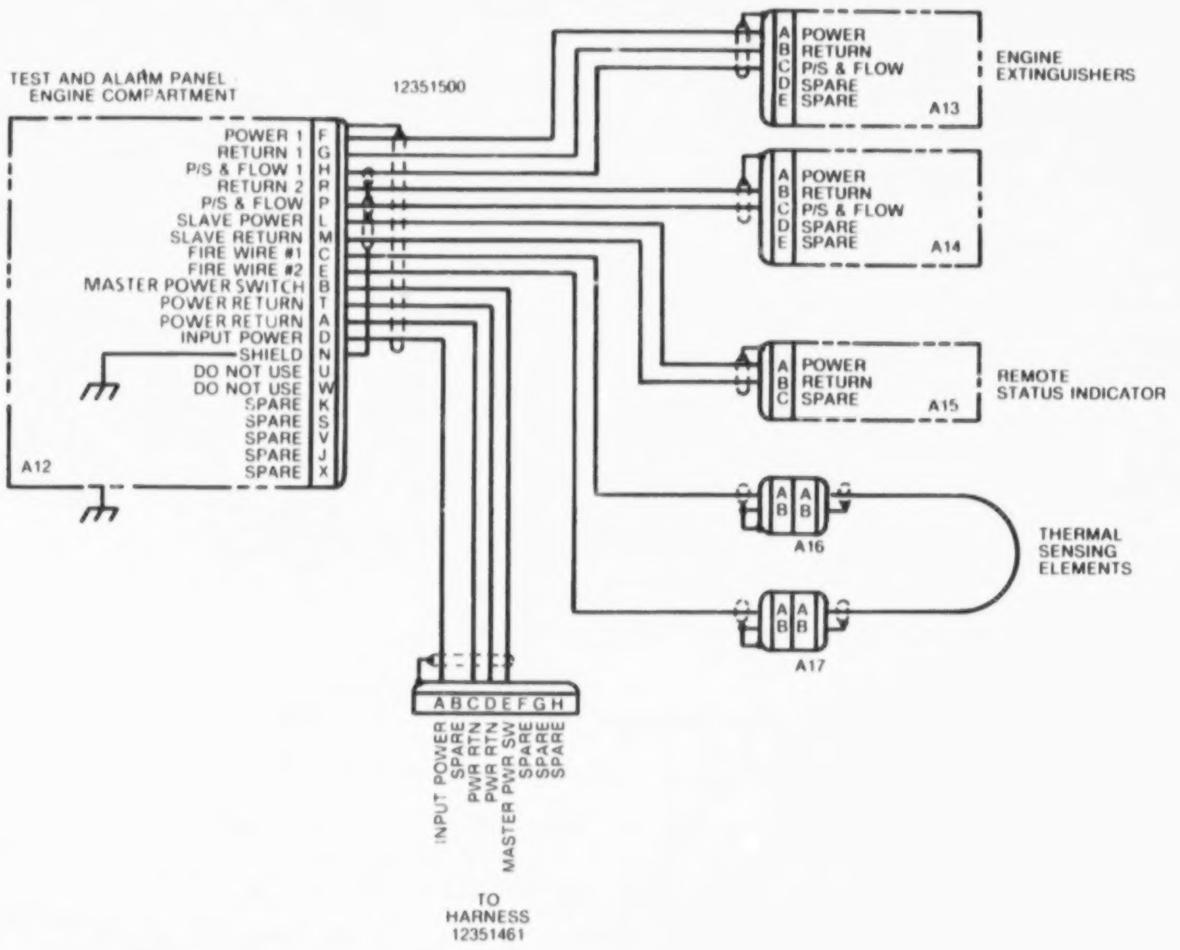
A Press LAMP TEST toggle switch to check for defective bulb. Replace defective bulbs.

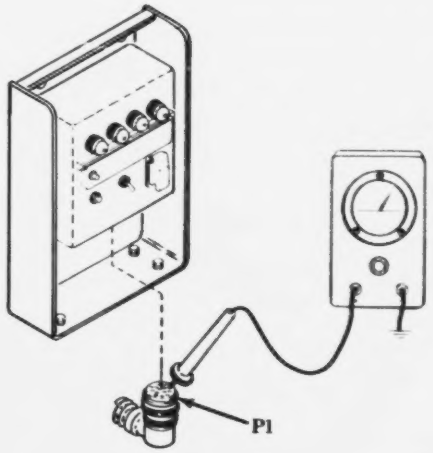
B If lamps on engine T/A panel do not operate when MASTER switch is turned ON, check battery charge. If charge is low, service batteries in accordance with TM 9-6140-200-14 or replace batteries (p 6-44). If batteries are good, go to step D.

WARNING

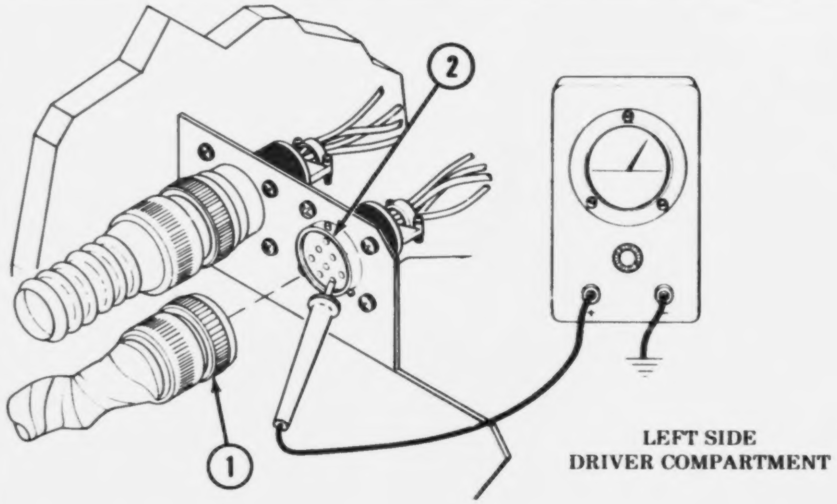
Turn engine T/A panel MAINTenance switch to vertical position before disconnecting any electrical wiring harnesses. Failure to comply may result in discharge of extinguisher cylinder(s) and injury to personnel.

C Turn engine T/A panel MAINTenance switch to vertical position.

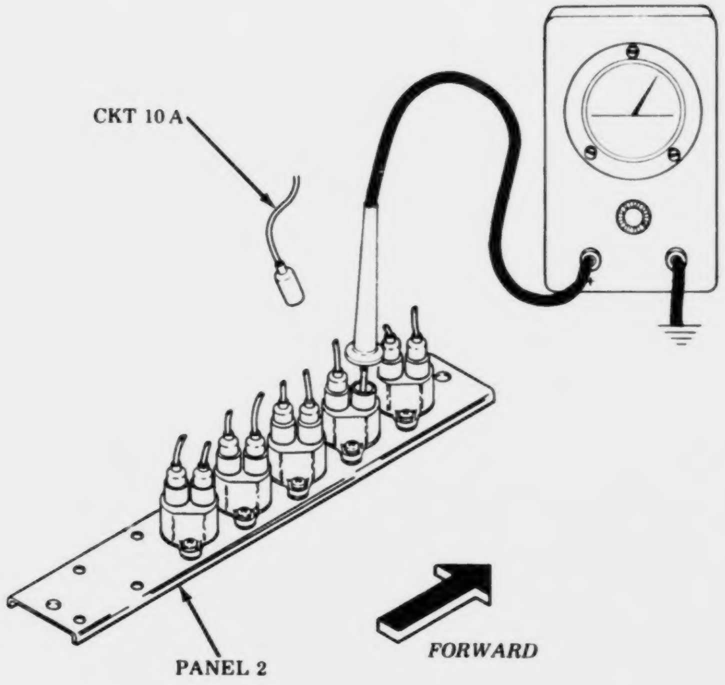

TEST AND ALARM PANEL
ENGINE COMPARTMENT
12351500
POWER 1 F
RETURN 1 G
P/S & FLOW 1 H
RETURN 2 R
P/S & FLOW P
SLAVE POWER L
SLAVE RETURN M
FIRE WIRE #1 C
FIRE WIRE #2 E
MASTER POWER SWITCH B
POWER RETURN T
POWER RETURN A
INPUT POWER D
SHIELD N
DO NOT USE U
DO NOT USE W
SPARE K
SPARE S
SPARE V
SPARE J
SPARE X
A12
A POWER
B RETURN
C P/S & FLOW
D SPARE
E SPARE
A13
ENGINE EXTINGUISHERS
A POWER
B RETURN
C P/S & FLOW
D SPARE
E SPARE
A14
A POWER
B RETURN
C SPARE
A15
REMOTE STATUS INDICATOR
A B A B
A16
A B A B
A17
THERMAL SENSING ELEMENTS
A B C D E F G H
INPUT POWER
SPARE
PWR RTN
PWR RTN
MASTER PWR SW
SPARE
SPARE
SPARE
TO HARNESS 12351461



D Disconnect wire harness 12351500 connector P1 from engine T/A panel. Place red probe of multimeter in pin socket E of wire harness 12351500 and ground black probe. Check for voltage. If voltage is indicated, go to step I. If no voltage is indicated, go to step E.



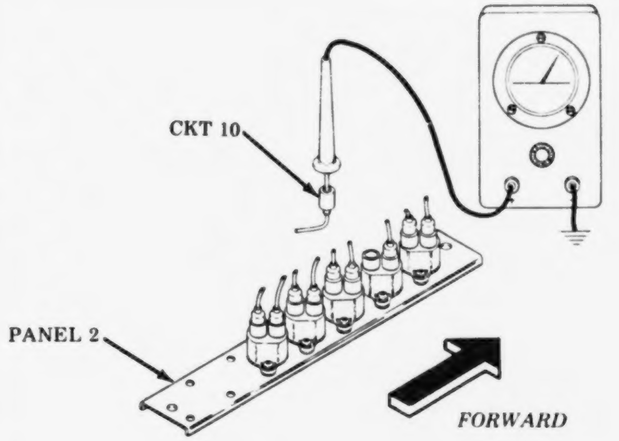
E Reconnect wire harness 12351500 connector P1 to engine T/A panel. Disconnect wire harness 12351500 connector P7 (1) from bracket-mounted socket (2) of harness 12351461. Place red probe of multimeter in pin socket A and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12351500. If no voltage is indicated, go to step F.



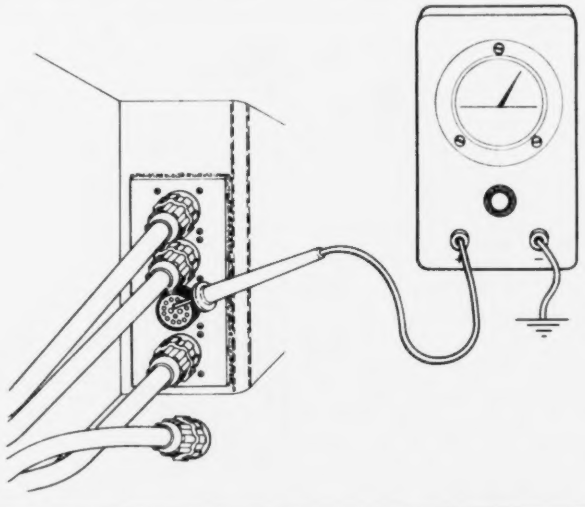
WARNING

Circuit 10A, if functioning properly, is a live circuit carrying a constant 24 volts. Exercise proper precautions when working with this circuit. Failure to do so may result in personal injury or equipment damage.

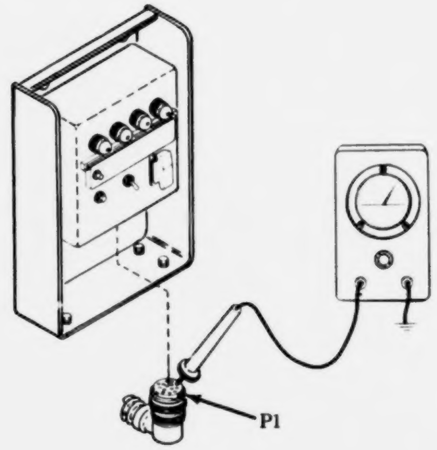
F Reconnect wire harness 12351500. Disconnect wiring harness 12351461, circuit 10A from number 6 positioned circuit breaker, panel no. 2 (located on sponson, directly behind engine T/A panel). Place red probe of multimeter in circuit breaker and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12351461. If no voltage is indicated, go to step G.



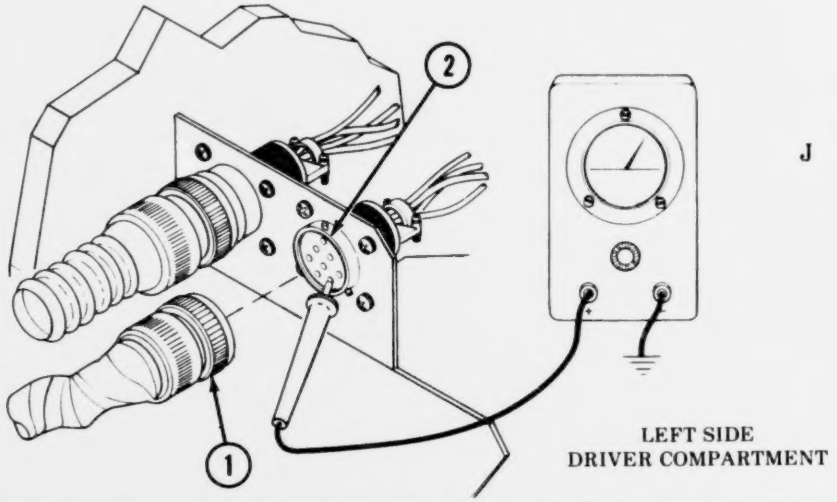
G Reconnect wire harness 12351461, circuit 10 to number 6 positioned circuit breaker, panel no. 2. Disconnect wire harness 12351754, circuit 10 from number 6 positioned circuit breaker. Place red probe of multimeter in circuit 10 connector and ground black probe. If voltage is indicated, replace circuit breaker 6 (p 6-54). If no voltage is indicated, go to step H.



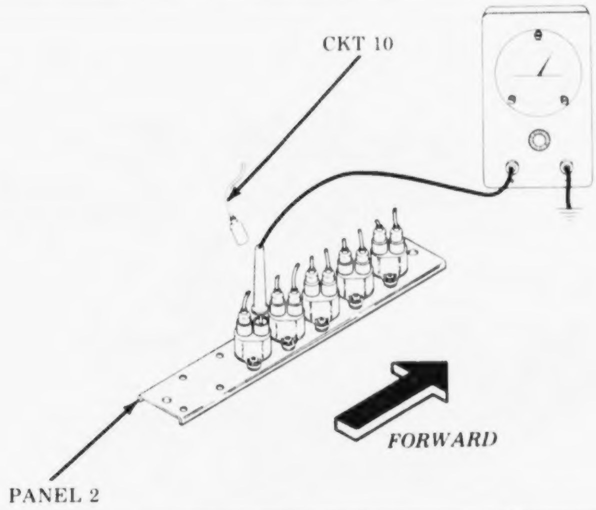
H Reconnect harness 12351754, circuit 10 to number 6 positioned circuit breaker. Disconnect wiring harness 12260287 at bulkhead and place red probe on connector pin socket S of harness 12268100 and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12260287 (p 6-84). If no voltage is indicated, troubleshoot harness 12268100 (p 6-68).



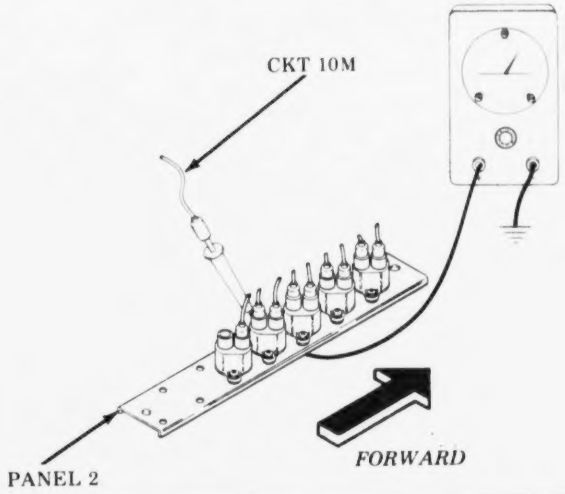
I Reconnect wire harness 12260287 at bulkhead. Disconnect wire harness 122351500 connector P1 from engine T/A panel. Place multimeter red probe on pin socket E of harness connector and ground black probe. Check for voltage. If voltage is indicated, replace engine T/A panel (p 14-39). If no voltage is indicated, go to step J.



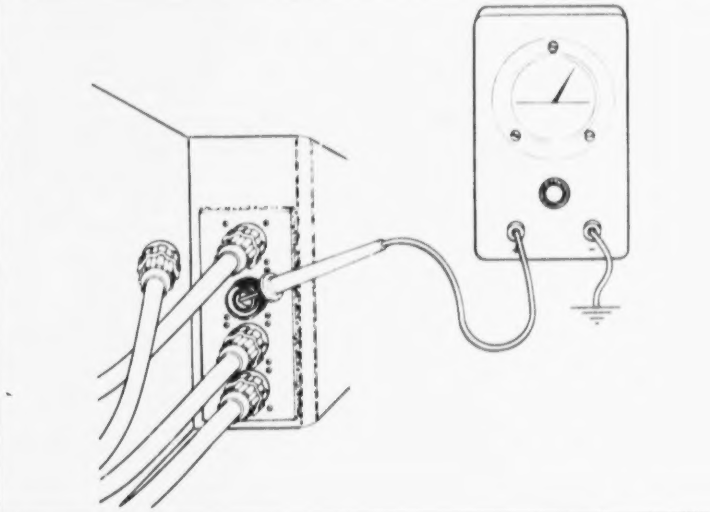
J Reconnect wire harness 12351500 connector P1 to engine T/A panel. Disconnect harness 12351500 connector P7 (1) from bracket-mounted socket (2) of harness 12351461. Place multimeter red probe in pin socket E and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12351500. If no voltage is indicated, go to step K.



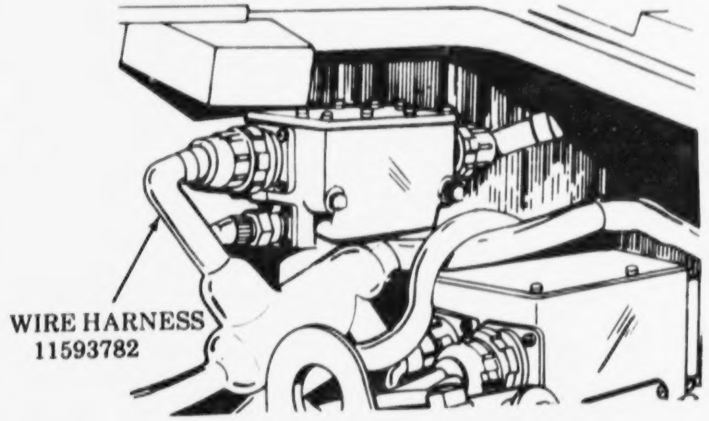
K Reconnect wire harness 12351500 connector P7 to bracket-mounted socket of harness 12351461. Disconnect wire harness 12351461, circuit 10 from number 3 positioned circuit breaker, panel no. 2. Place red probe of multimeter in circuit breaker socket and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12351461, circuit 10 (p 6-93). If no voltage is indicated, go to step L.



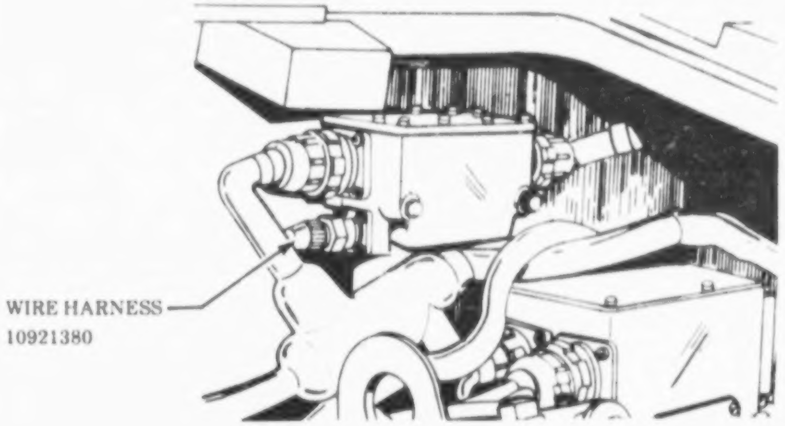
L Reconnect wire harness 12351461, circuit 10 to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 circuit 10M from number 3 positioned circuit breaker. Place red probe of multimeter in circuit 10M and ground black probe. Check for voltage. If voltage is indicated, replace 15 amp circuit breaker. If no voltage is indicated, go to step M.



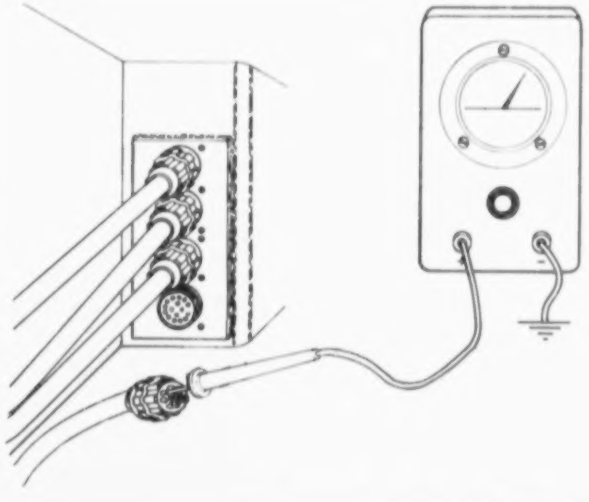
M Reconnect wire harness 12330257 circuit 10M to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 at bulkhead. Place red probe of multimeter in pin socket 49 of wire harness 11593782 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 12330257. If no voltage is indicated, go to step N.



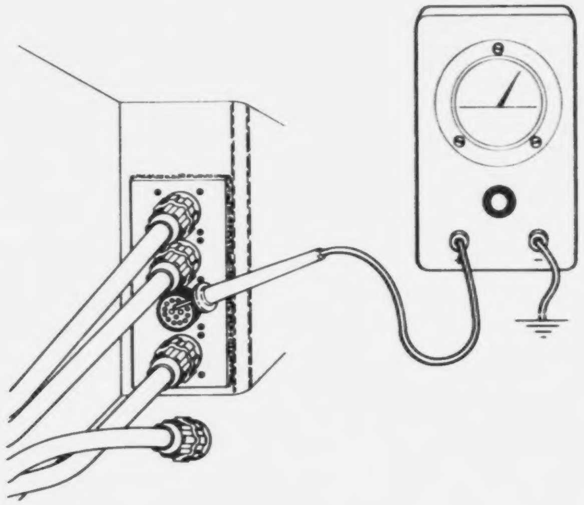
N Reconnect wire harness 12330257 at bulkhead. Disconnect wire harness 11593782 at master relay. Place red probe of multimeter in connector 82 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 11593782. If no voltage is indicated, go to step O.



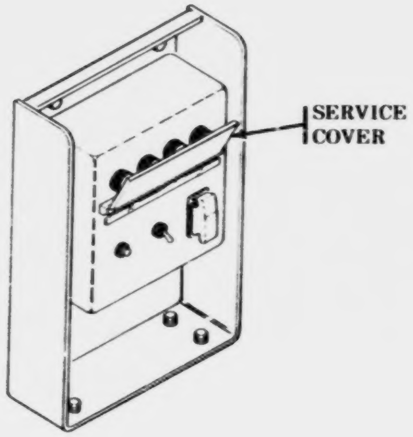
O Reconnect wire harness 11593782 at master relay. Disconnect wire harness 10921380 at master relay. Place red probe of multimeter in connector 459 and ground black probe. Check for voltage. If voltage is indicated, repair or replace master relay. If no voltage is indicated, go to step P.



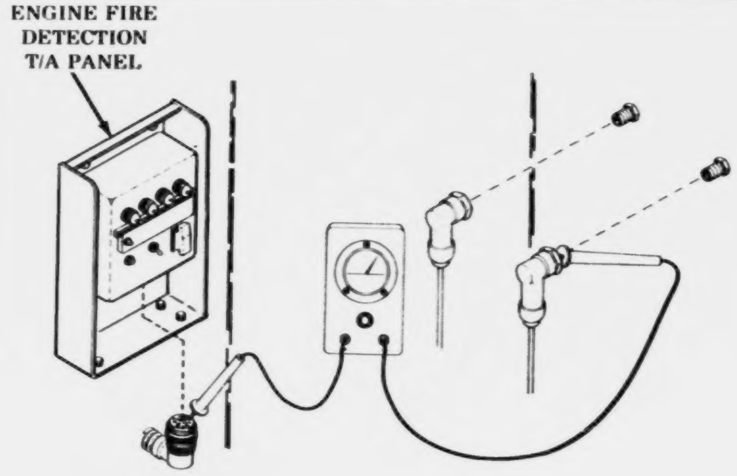
P Reconnect wire harness 10921380 at master relay. Disconnect wire harness 12330252 at bulkhead. Place red probe of multimeter in pin H of wire harness 10921380 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 10921380. If no voltage is indicated, go to step Q.



Q Reconnect wire harness 12330252 at bulkhead. Disconnect wire harness 12260287 at bulkhead. Place red probe of multimeter on pin socket B of wire harness 12268100 and ground black probe. Check for voltage. If no voltage is indicated, repair or replace wire harness 12268100. If voltage is indicated, verify no fault.



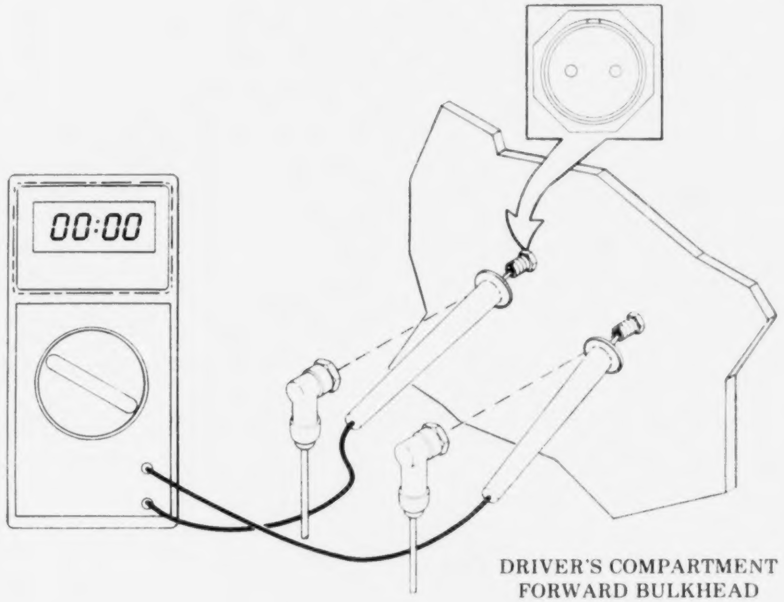
R Open service cover of engine T/A panel and check status of LED's. If F/W LED is lit, troubleshoot engine compartment thermal sensing elements, step L. If T/A LED is lit, replace engine T/A panel (p14-39). If AUTO LED is lit, go to step Y. If MANUAL LED is lit, go to step AB.



S Disconnect harness 12351500 connector P1 from engine T/A panel and disconnect two harness connectors (P5 and P6) from bulkhead connectors (directly in front of driver). Check circuit continuity between connectors as indicated below:

Connector P1	Connector P5
Pin C	A
Pin N	B
	Connector P6
Pin E	A
Pin N	B

If continuity is not indicated between one or more of the above points, replace harness 12351500 (p 14-50.5). If continuity is indicated between all of the above points, go to step T.



DRIVER'S COMPARTMENT
FORWARD BULKHEAD

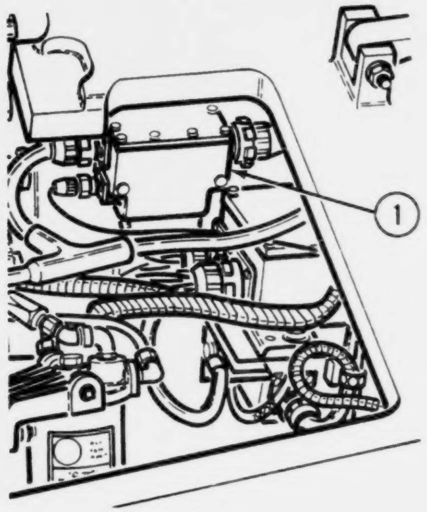
CAUTION

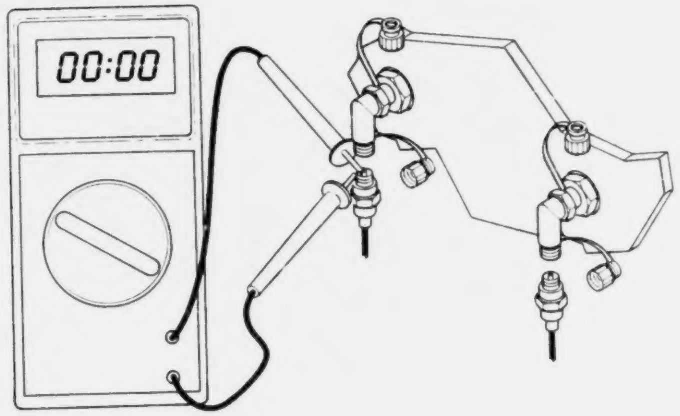
Digital multimeter (DMM) must not be operated any longer than is necessary to obtain reading. Misleading improvements in resistance readings could result.

NOTE

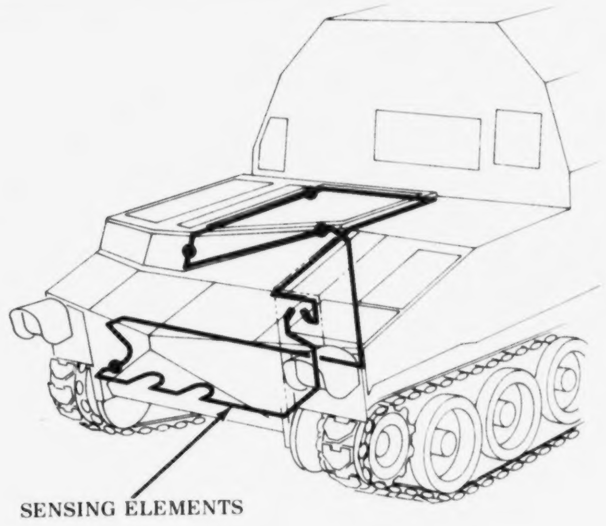
Use only a DMM for following tests. Do not use a standard VOLT/OHM METER (VOM); its method of operation will not give accurate indications.

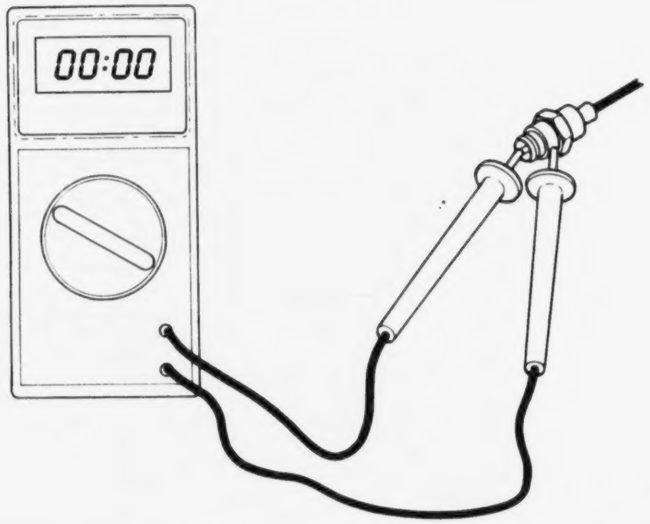
T Using a DMM as shown, check resistance of center wire of complete loop of thermal sensing elements. Resistance must be more than 95 ohms, but less than 180.5 ohms. If resistance indicated is outside limits, go to step X. If resistance indicated is correct, go to step U.





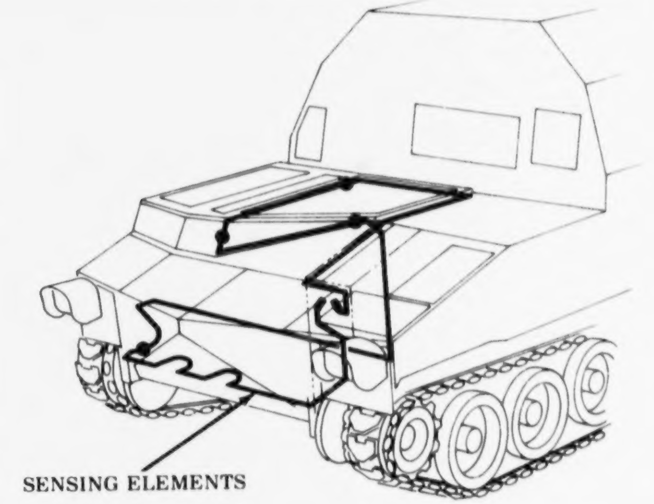
U Open left transmission door and forward battery door. Support doors in open position. Remove lead 81 wire harness 12268100 from relay (1) (p 6-46). Disconnect two thermal wire connectors from 90-degree elbows. Using a DMM with a range greater than 1 megohm, measure the insulation resistance between center wire and outer sheath of complete loop of connected thermal sensing elements. If the DMM reading is 00, replace engine T/A panel (p 14-39). If resistance indicated is less than 1 megohm, go to step V.

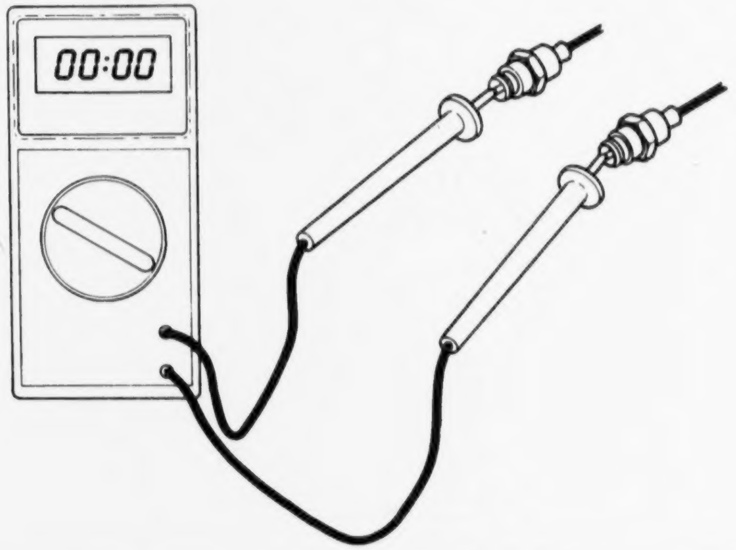




V Open engine grille door and disconnect all sensing elements from couplings (p 14-26).

W Using a DMM, measure resistance between center wire and outer sheath of each of five sensing elements and six couplings separately until fault is located. Resistance of each item must be greater than 2 kilohms. Replace any defective component (p 14-15 thru p 14-26).





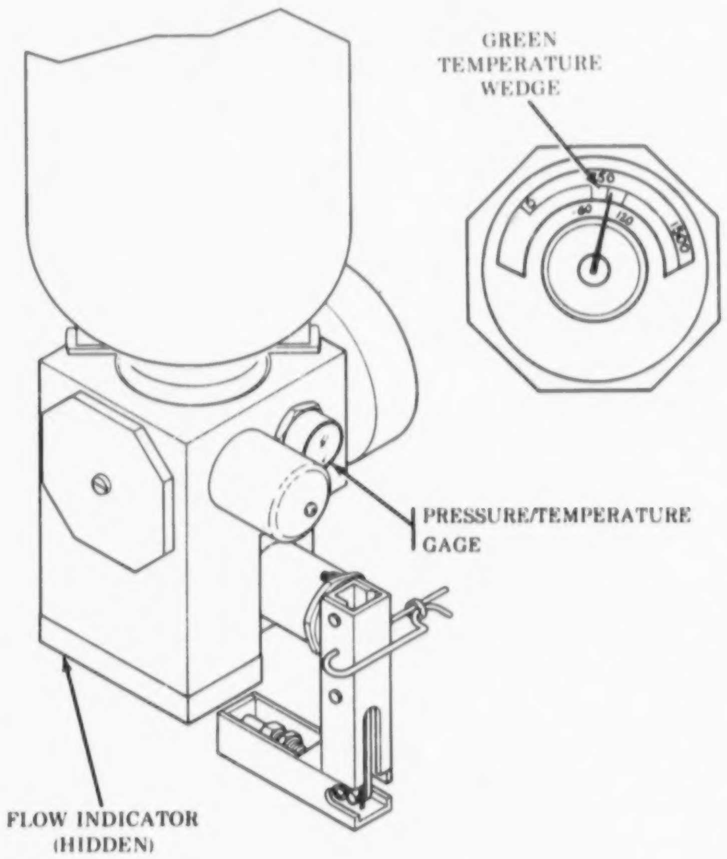
NOTE

Sixty-inch elements are installed at underside of engine deck, above the engine.

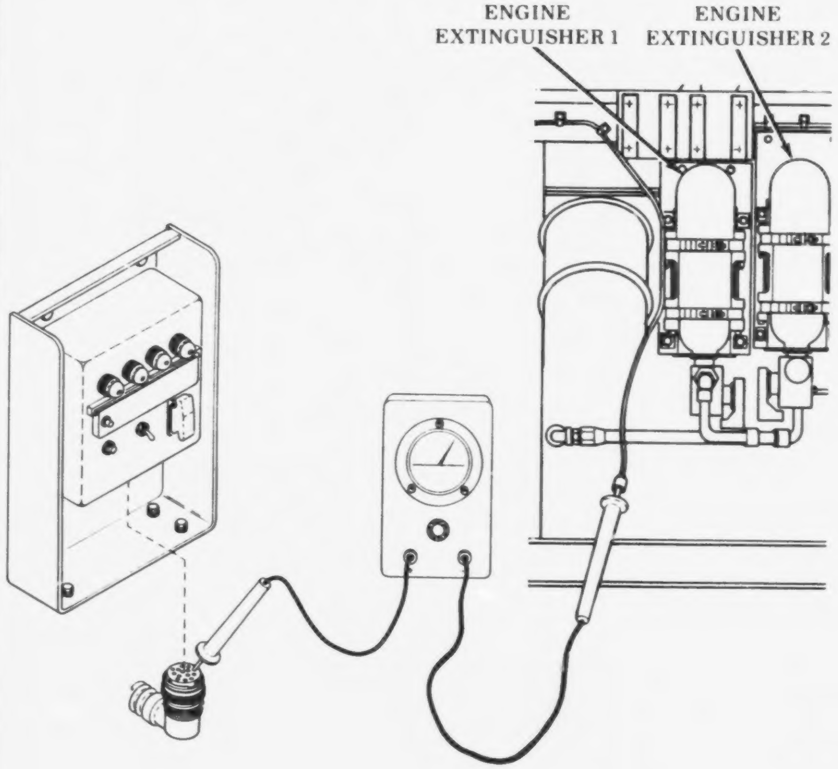
X Using a DMM, measure resistance of center wire of each of five elements and six couplings separately until fault is located. Resistance of sensing elements must fall within following parameters:

SENSING ELEMENT LENGTH	MIN OHMS	MAX OHMS
150"	25.0	37.5
60"	10.0	30.0
COUPLING	0.0	1.0

Replace any defective component (p 14-15 thru p 14-26).


GREEN TEMPERATURE WEDGE
15
350
60
120
PRESSURE/TEMPERATURE GAGE
FLOW INDICATOR (HIDDEN)

Y Remove left projectile rack (TM 9-2350-267-10). Check for protruding flow indicator of valve actuator of engine extinguisher no. 1. Check pressure gage of engine extinguisher no. 1. Black pointer of pressure gage must be on green temperature wedge. If pressure is correct, but flow indicator is protruding, reset flow indicator by pushing into valve body. If pressure is low, replace engine extinguisher no. 1. If indicator is not protruding from valve, and pressure gage is correct, go to step Z.



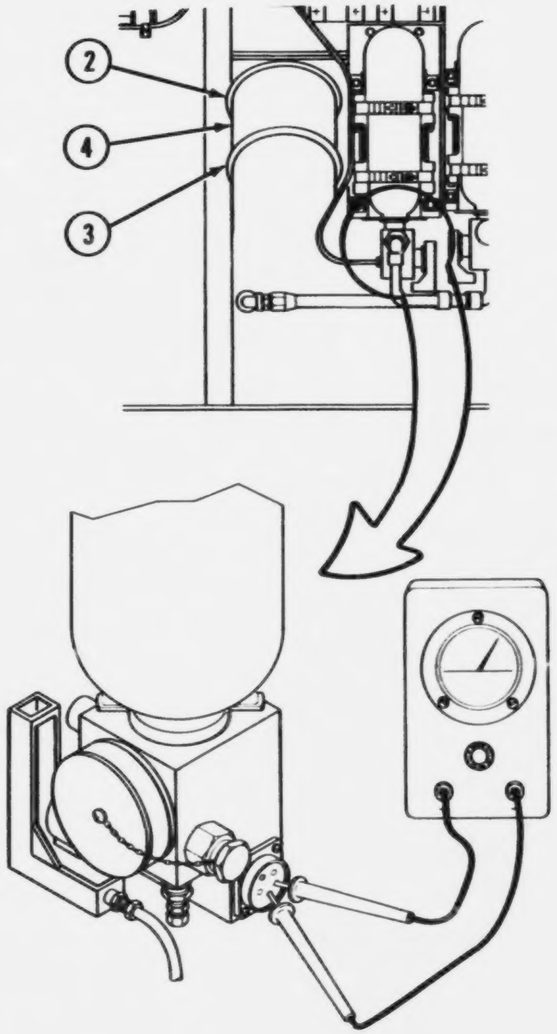
WARNING

Make sure MASTER switch is OFF. Make sure engine T/A panel MAINTenance switch is in vertical position. Failure to comply may result in cylinder discharge.

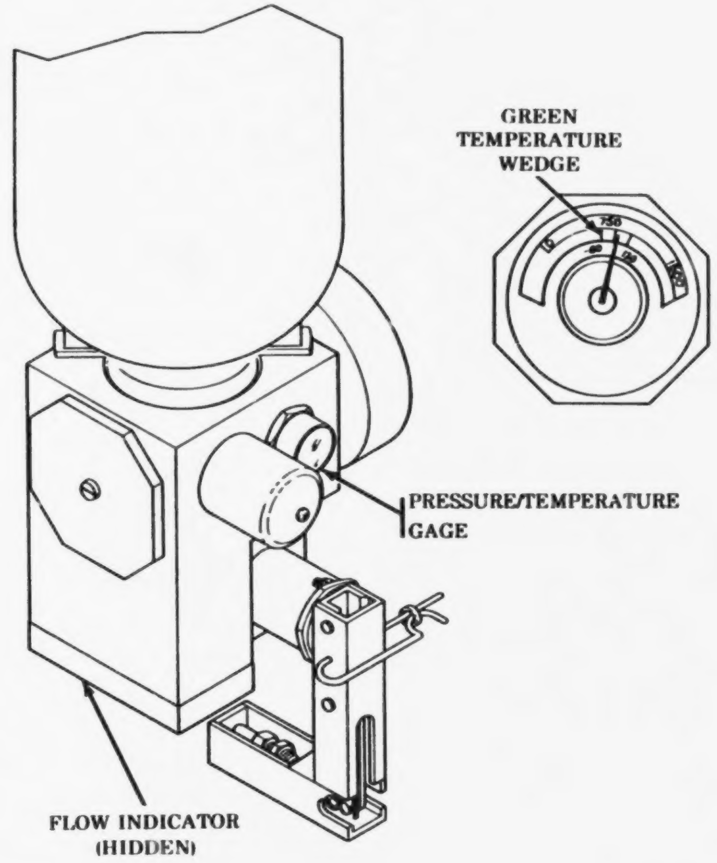
Z Disconnect harness 12351500 connector P1 from engine T/A panel and connector P2 from valve actuator of engine extinguisher no. 1. Using a multimeter, check continuity as follows:

T/A PANEL CONNECTOR P1	EXTINGUISHER CONNECTOR P2
Pin F	Pin A
Pin G	Pin B
Pin H	Pin C

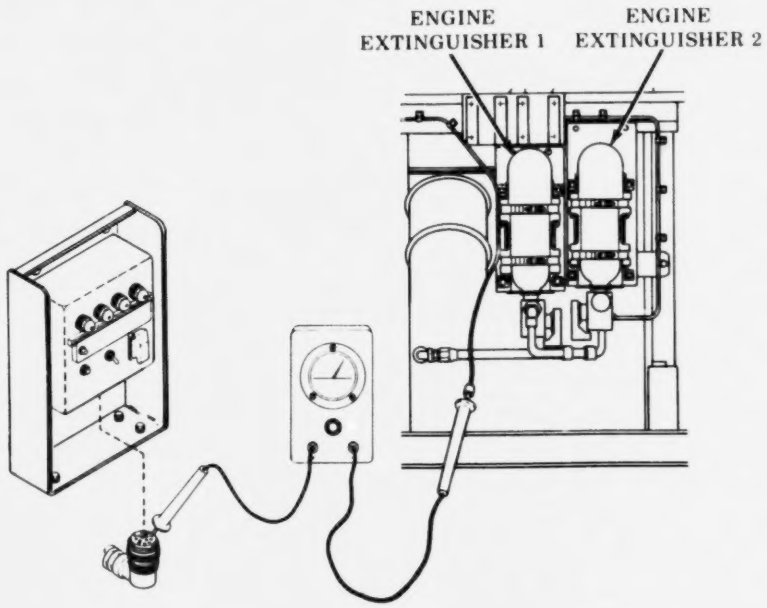
If there is no continuity in any one or all circuits, replace harness 12351500 (p 14-50.5). If continuity is indicated, go to step AA.



AA If necessary for access, loosen clamps (2 and 3), and remove ventilation duct hose (4). Using a multimeter, check continuity between pins A-B and B-C of engine extinguisher no. 1 actuator socket. If no continuity is indicated, replace engine fire extinguisher no. 1 (p 14-28). If continuity is indicated, replace engine T/A panel (p 14-39).


GREEN TEMPERATURE WEDGE
750
PRESSURE/TEMPERATURE GAGE
FLOW INDICATOR (HIDDEN)

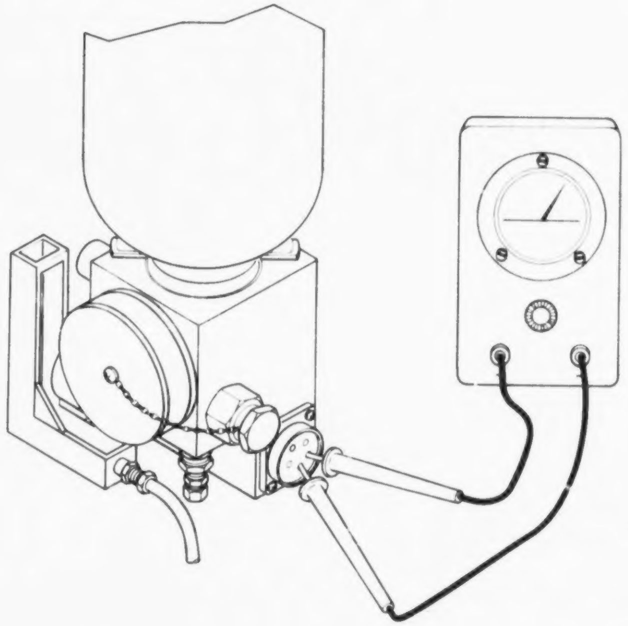
AB Remove left projectile rack (TM 9-2350-267-10). Check for protruding flow indicator of valve actuator of engine extinguisher no. 2. If necessary for access, loosen clamps (2 and 3), and remove ventilation duct hose (4). Check pressure gage of engine extinguisher no. 2. Black pointer of pressure gage must be on green temperature wedge. If pressure is correct, but flow indicator is protruding, reset flow indicator by pushing into valve body. If pressure is low, replace engine extinguisher no. 2 (p 14-28). If flow indicator is not protruding from valve, and pressure indicator is correct, go to step AC.


ENGINE EXTINGUISHER 1
ENGINE EXTINGUISHER 2

AC Disconnect harness 12351500 connector P1 from engine T/A panel and connector P3 from valve actuator of engine extinguisher no. 2. Using a multimeter, check continuity as follows:

T/A PANEL CONNECTOR P1	EXTINGUISHER CONNECTOR P3
Pin R	Pin B
Pin P	Pin C

If no continuity in any one or all circuits, replace harness 12351500 (p 14-50.5). If continuity is indicated, go to step AD.



AD Remove right projectile rack (TM 9-2350-267-10). Using a multimeter, check continuity between circuits B-C of engine extinguisher no. 2 actuator socket. If no continuity is indicated, replace engine extinguisher no. 2 (p 14-28). If continuity is indicated, replace engine T/A panel (p 14-39).

CREW AUTOMATIC FIRE EXTINGUISHER SYSTEM FIRE DETECTION TEST AND ALARM PANEL INDICATORS (EFFECTIVE FOR VEHICLES 1 THRU 344)	**POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON Do steps A thru Q FAULT LAMP REMAINS ON Go to step R**

START HERE

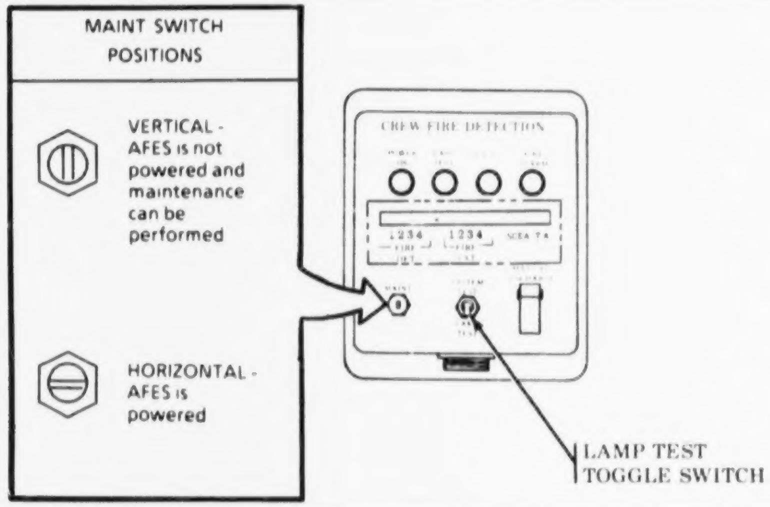
Before troubleshooting AFES, check the following:

1 Make sure MASTER switch is ON.

2 Make sure crew T/A panel MAINTenance switch is turned to horizontal position.

NOTE

Use flat-tip screwdriver to rotate MAINTenance switch.


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
1234
1234
LAMP TEST TOGGLE SWITCH

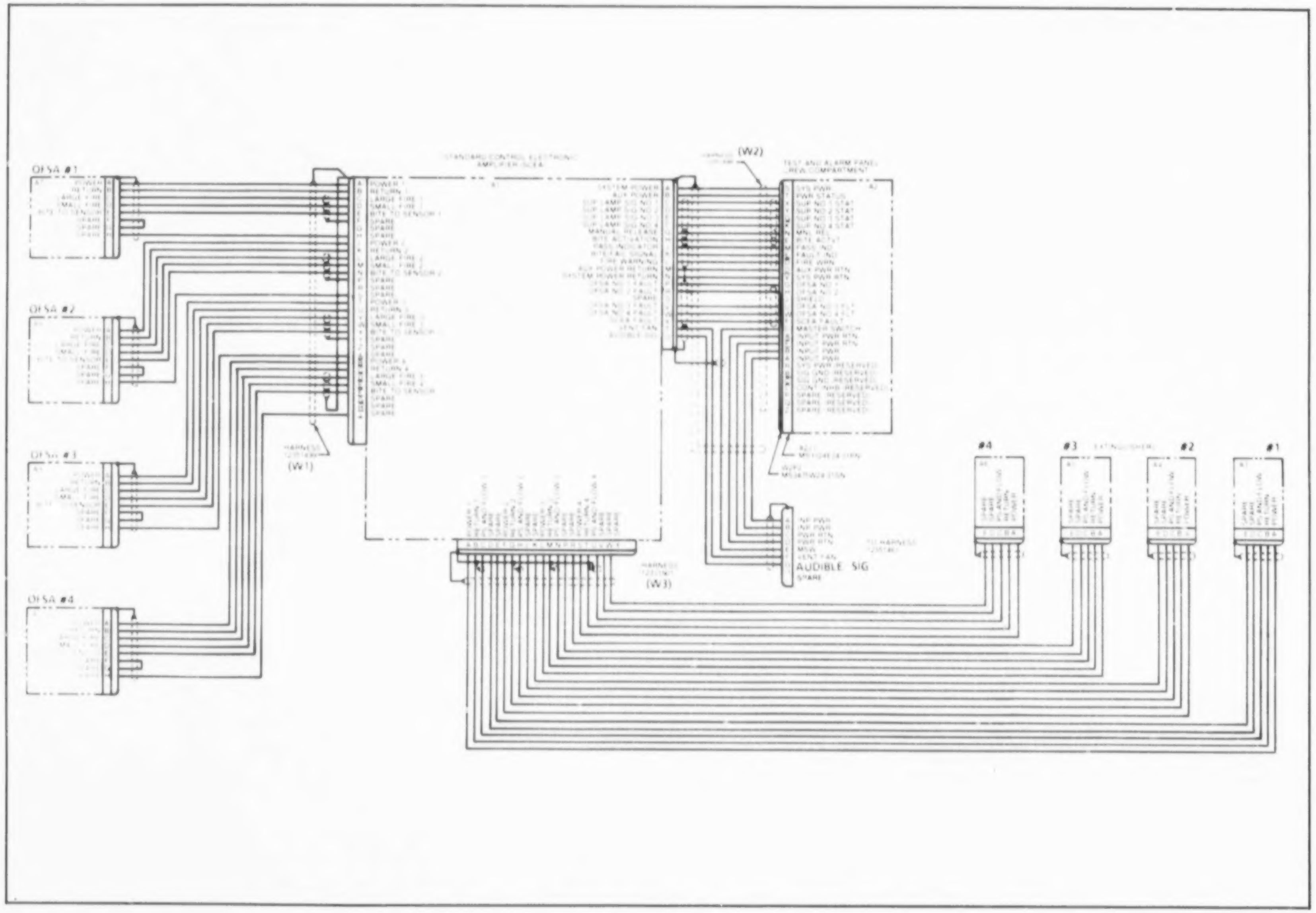
A Press LAMP TEST toggle switch to check for defective bulb. Replace defective bulbs.

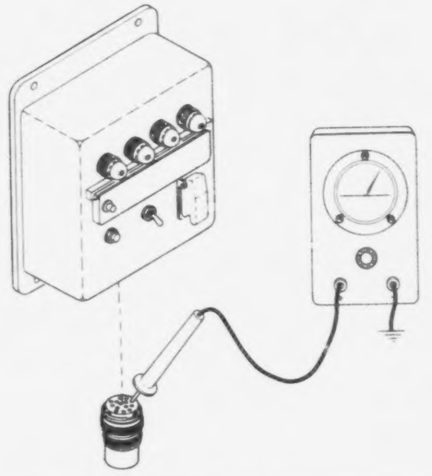
B If lamps on crew T/A panel do not operate when MASTER switch is turned ON, check battery charge. If charge is low, service batteries in accordance with TM 9-6140-200-14 or replace batteries (p 6-44). If batteries are good, go to step D.

WARNING

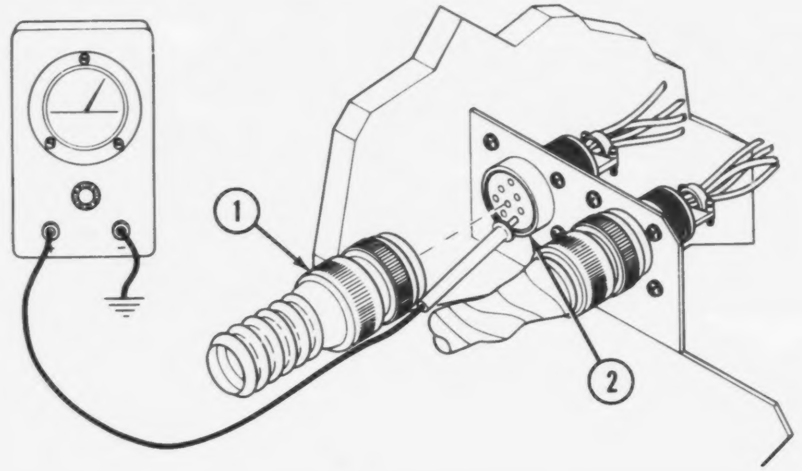
Turn crew T/A panel MAINTenance switch to vertical position before disconnecting any electrical wiring harnesses. Failure to comply may result in discharge of extinguisher cylinder(s) and injury to personnel.

C Turn crew T/A panel MAINTenance switch to vertical position.

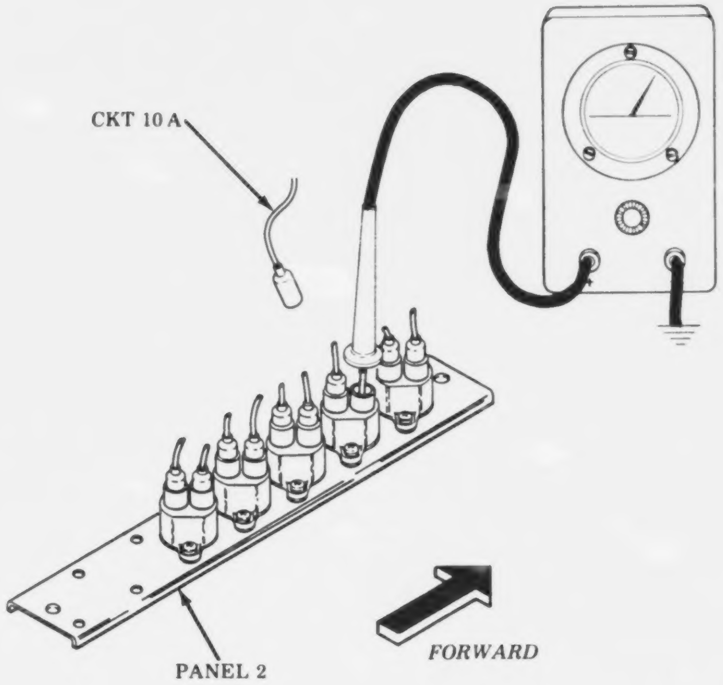

OFSA #1
OFSA #2
OFSA #3
OFSA #4
POWER
RETURN
LARGE FIRE
SMALL FIRE
BITE TO SENSOR
SPARE
STANDARD CONTROL ELECTRONIC AMPLIFIER (SCEA)
A1
POWER 1
RETURN 1
LARGE FIRE 1
SMALL FIRE 1
BITE TO SENSOR 1
POWER 2
RETURN 2
LARGE FIRE 2
SMALL FIRE 2
BITE TO SENSOR 2
POWER 3
RETURN 3
LARGE FIRE 3
SMALL FIRE 3
BITE TO SENSOR 3
POWER 4
RETURN 4
LARGE FIRE 4
SMALL FIRE 4
BITE TO SENSOR 4
HARNESS
(W1)
SYSTEM POWER
AUX POWER
SUP LAMP SIG NO 1
SUP LAMP SIG NO 2
SUP LAMP SIG NO 3
SUP LAMP SIG NO 4
MANUAL RELEASE
BITE ACTIVATION
PASS INDICATOR
BITE FAIL SIGNAL
FIRE WARNING
AUX POWER RETURN
SYSTEM POWER RETURN
OFSA NO 1 FAULT
OFSA NO 2 FAULT
OFSA NO 3 FAULT
OFSA NO 4 FAULT
SCEA FAULT
VENT FAN
AUDIBLE SIG
HARNESS
(W2)
TEST AND ALARM PANEL CREW COMPARTMENT
A2
SYS PWR
PWR STATUS
SUP NO 1 STAT
SUP NO 2 STAT
SUP NO 3 STAT
SUP NO 4 STAT
MNL REL
BITE ACTVT
PASS IND
FAULT IND
FIRE WRN
AUX PWR RTN
SYS PWR RTN
OFSA NO 1
OFSA NO 2
SHIELD
OFSA NO 3 FLT
OFSA NO 4 FLT
SCEA FAULT
MASTER SWITCH
INPUT PWR RTN
INPUT PWR RTN
INPUT PWR
INPUT PWR
SYS PWR (RESERVED)
SIG GND (RESERVED)
SIG GND (RESERVED)
CONT INHB (RESERVED)
SPARE (RESERVED)
SPARE (RESERVED)
SPARE (RESERVED)
INP PWR
INP PWR
PWR RTN
PWR RTN
MSW
VENT FAN
AUDIBLE SIG
SPARE
TO HARNESS
HARNESS
(W3)
A B C D E F G H J K L M N P R S T U V W X
#4
#3
EXTINGUISHER
#2
#1



D Disconnect wire harness 12351498 from crew T/A panel. Place red probe of multimeter in pin socket A of harness and ground black probe. Check for voltage. Check pin B for voltage. If voltage is indicated, go to step I. If no voltage is indicated, go to step E.



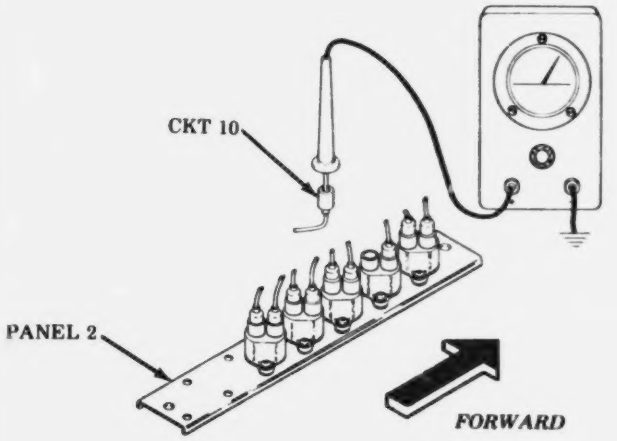
E Reconnect wire harness 12351498 to crew T/A panel. Disconnect wire harness 12351498 from bracket-mounted socket 12351461. Place red probe of multimeter in pin socket A of bracket mounted socket 12351461 and ground black probe. Check for voltage. Check pin socket B for voltage. If voltage is indicated, replace wire harness 12351498 (p 14-40.2). If no voltage is indicated, go to step F.



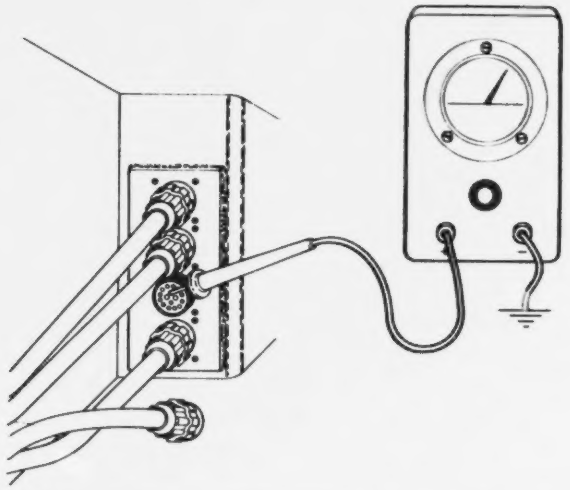
WARNING

Circuit 10A, if functioning properly, is a live circuit carrying a constant 24 volts. Exercise proper precautions when working with this circuit. Failure to do so may result in personal injury or equipment damage.

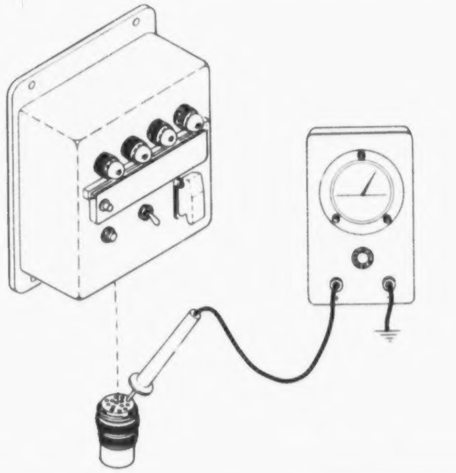
F Reconnect wire harness 12351498 to bracket-mounted socket 12351461. Disconnect wiring harness 12351461, circuit 10A from number 6 positioned circuit breaker, panel no. 2 (located on sponson, directly behind engine T/A panel). Place red probe of multimeter in circuit breaker and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12351461. If no voltage is indicated, go to step G.



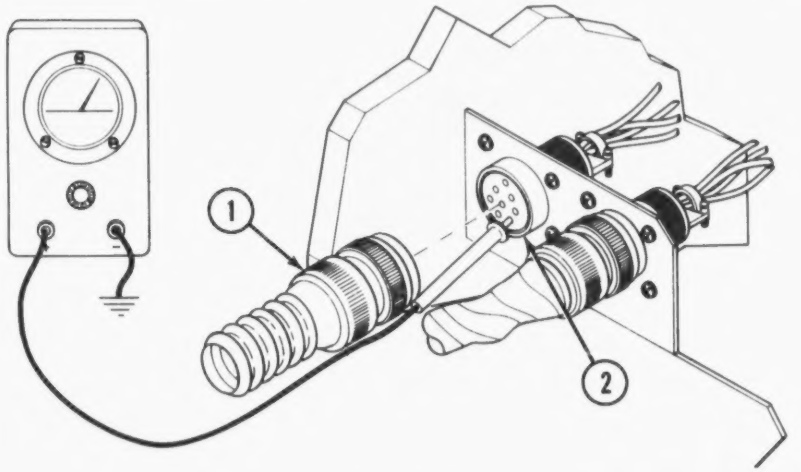
G Reconnect wire harness 12351461, circuit 10A to number 6 positioned circuit breaker, panel no. 2. Disconnect harness 12351754, circuit 10 from number 6 positioned circuit breaker, panel no. 2. Place red probe of multimeter in circuit 10 connector and ground black probe. If voltage is indicated, replace circuit breaker 6 (p 6-54). If no voltage is indicated, go to step H.



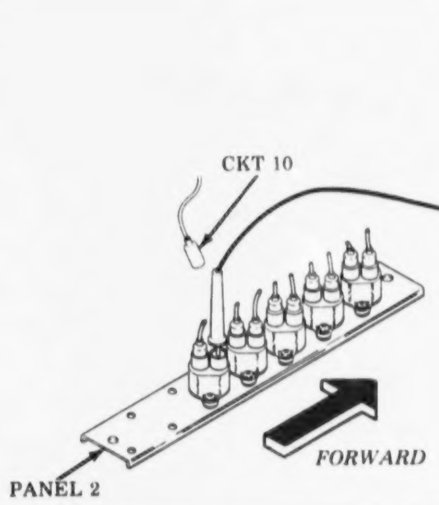
H Reconnect wire harness 12351754, circuit 10 to number 6 positioned circuit breaker, panel no. 2. Disconnect wiring harness 12260287 at bulkhead, place red probe on connector pin socket S of harness 12268100 and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12260287 (p 6-84). If no voltage is indicated, troubleshoot harness 12268100 (p 6-68).



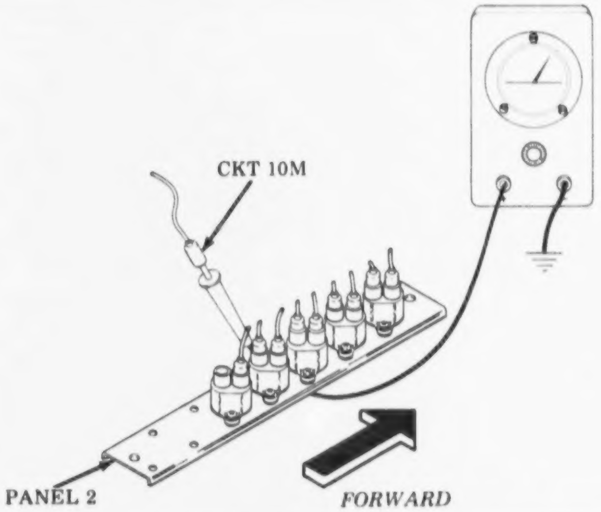
I Reconnect wiring harness 12260287 at bulkhead. Disconnect harness wire 12351498 connector from crew T/A panel. Place multimeter red probe on pin C of harness connector and ground black probe. Check for voltage. If voltage is indicated, replace crew T/A panel (p 14-40). If no voltage is indicated, go to step J.



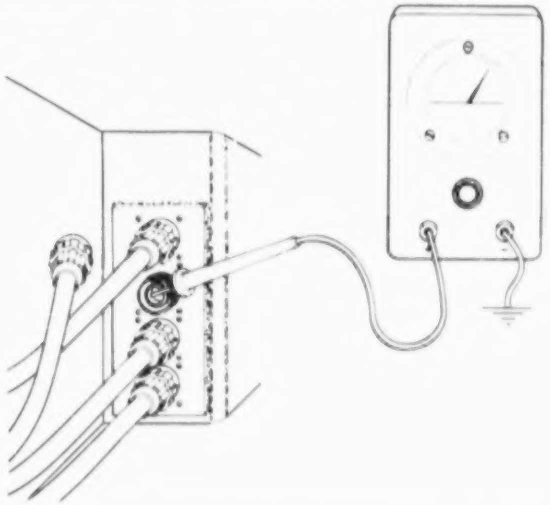
J Reconnect wire harness 12351498 to crew T/A panel. Disconnect harness wire 12351498 connector (1) from bracket-mounted socket (2) of harness 12351461. Place multimeter red probe on pin E of socket and ground black probe. Check for voltage at bracket-mounted socket 12351461. If voltage is indicated, replace wire harness 12351498 (p 14-40.2). If no voltage is indicated, go to step K.



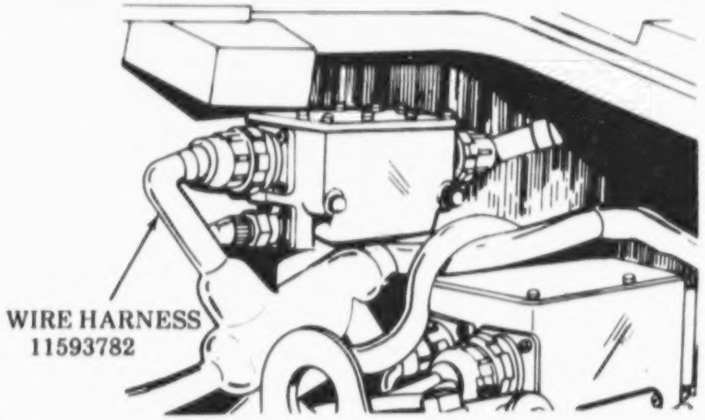
K Reconnect wire harness 12351498 to bracket-mounted socket of harness 12351461. Disconnect wire harness 12351461, circuit 10 from number 3 positioned circuit breaker, panel no. 2. Place red probe of multimeter in circuit breaker socket and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12351461, circuit 10 (p 6-93). If no voltage is indicated, go to step L.



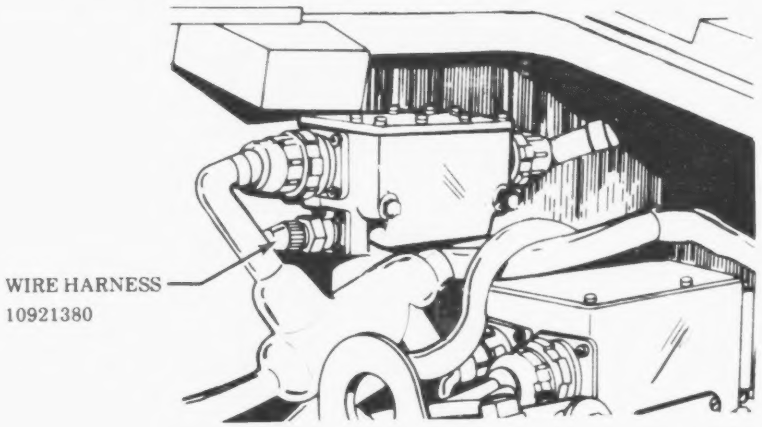
L Reconnect wire harness 12351461, circuit 10 to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 circuit 10M from number 3 positioned circuit breaker. Place red probe of multimeter in circuit 10M and ground black probe. Check for voltage. If voltage is indicated, replace 15 amp circuit breaker. If no voltage is indicated, go to step M.



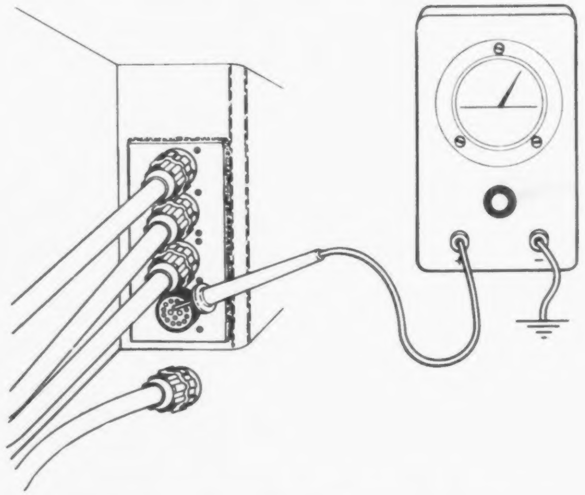
M Reconnect wire harness 12330257, circuit 10 to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 at bulkhead. Place red probe of multimeter in pin socket 49 of wire harness 11593782 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 12330257. If no voltage is indicated, go to step N.



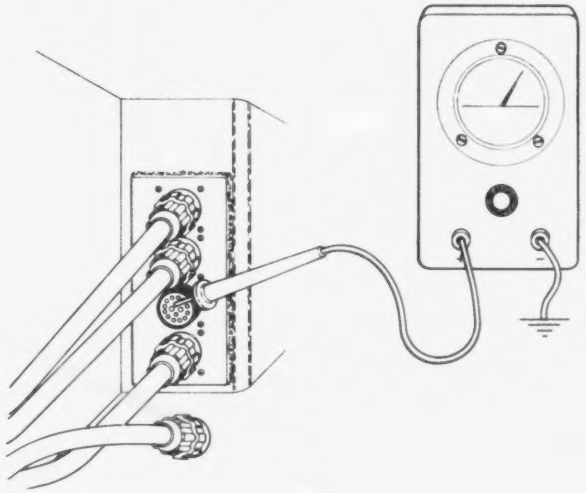
N Reconnect wire harness 12330257 at bulkhead. Disconnect wire harness 11593782 at master relay. Place red probe of multimeter in plug 82 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 11593782. If no voltage is indicated, go to step O.



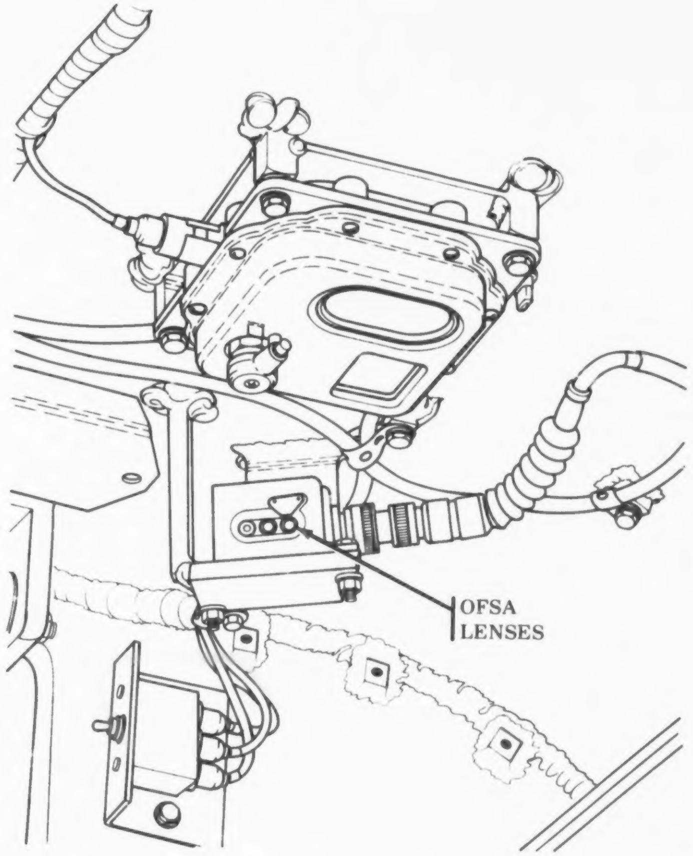
O Reconnect wire harness 11593782 at master relay. Disconnect wire harness 10921380 at master relay. Place red probe of multimeter in connector 459 and ground black probe. Check for voltage. If voltage is indicated, repair or replace master relay. If no voltage is indicated, go to step P.



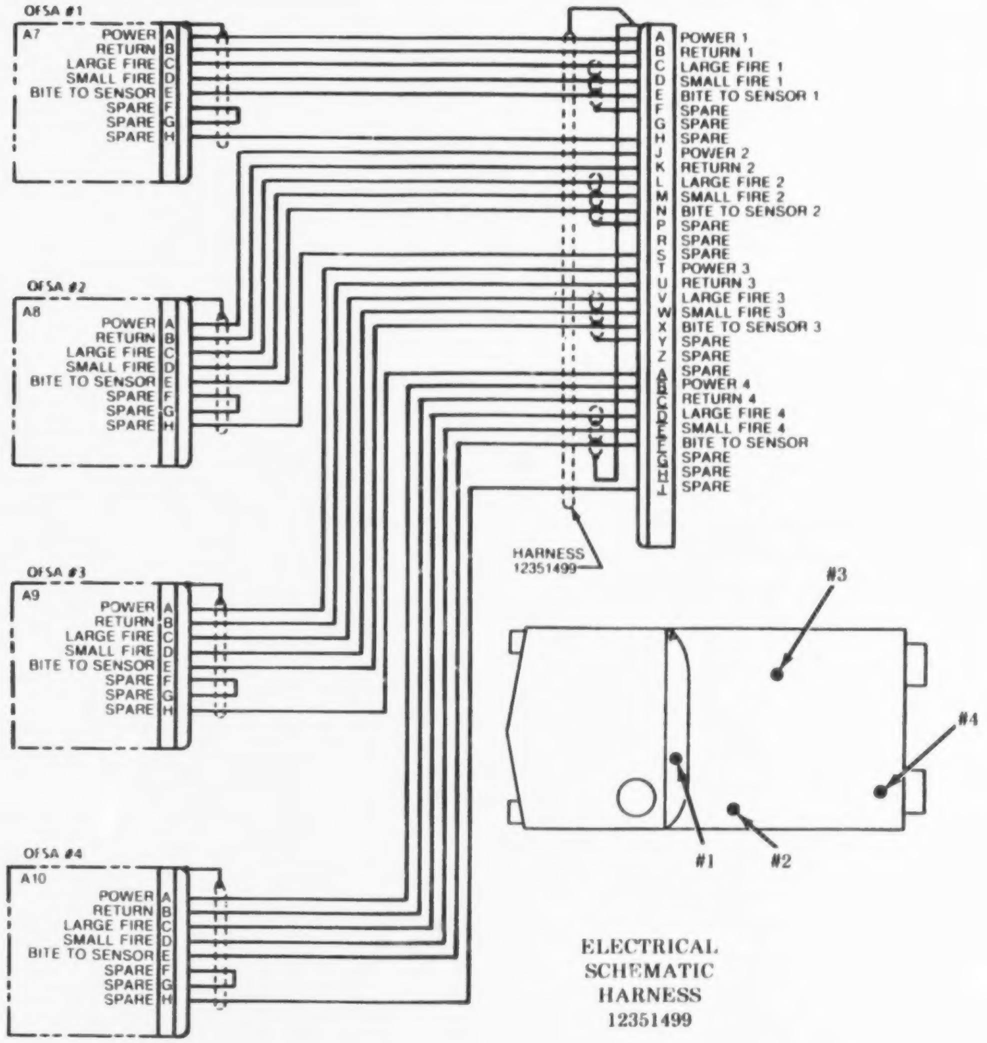
P Reconnect wire harness 10921380 at master relay. Disconnect wire harness 12330252 at bulkhead. Place red probe of multimeter in pin H of wire harness 10921380 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 10921380. If no voltage is indicated, go to step Q.



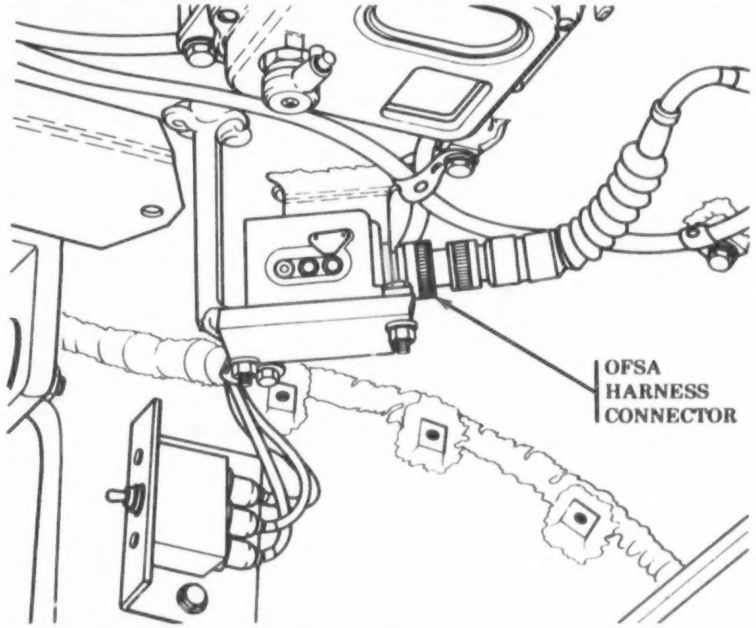
Q Reconnect wire harness 12330252 at bulkhead. Disconnect wire harness 12260287 at bulkhead. Place red probe of multimeter on pin B of wire harness 12268100 and ground black probe. Check for voltage. If no voltage is indicated, check for continuity in wire harness 12268100. If voltage is indicated, go to step W.

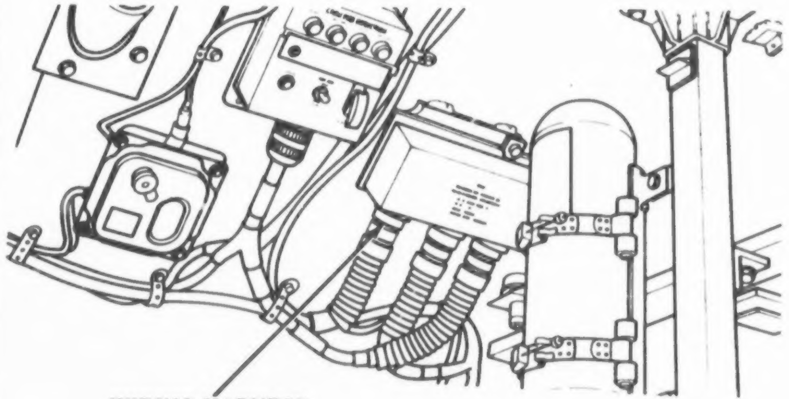


R Using lens paper (item 45, Appx D) clean lenses of all four optical fire sensing assemblies (OFSA). Run system test by pressing crew T/A panel toggle switch to SYSTEM TEST and releasing. If any one of four FIRE DET LED's is still lit, check that all connector backshells are secure. If any FIRE DET LED's are still lit, turn crew T/A panel MAINTenance switch to vertical position and replace defective OFSA's as indicated by lit LED's. If LED's still light, go to step S.


OFSA #1
A7
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
OFSA #2
A8
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
OFSA #3
A9
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
OFSA #4
A10
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
A POWER 1
B RETURN 1
C LARGE FIRE 1
D SMALL FIRE 1
E BITE TO SENSOR 1
F SPARE
G SPARE
H SPARE
J POWER 2
K RETURN 2
L LARGE FIRE 2
M SMALL FIRE 2
N BITE TO SENSOR 2
P SPARE
R SPARE
S SPARE
T POWER 3
U RETURN 3
V LARGE FIRE 3
W SMALL FIRE 3
X BITE TO SENSOR 3
Y SPARE
Z SPARE
A SPARE
B POWER 4
C RETURN 4
D LARGE FIRE 4
E SMALL FIRE 4
F BITE TO SENSOR
G SPARE
H SPARE
J SPARE
HARNESS
12351499
#3
#4
#1
#2

ELECTRICAL
SCHEMATIC
HARNESS
12351499

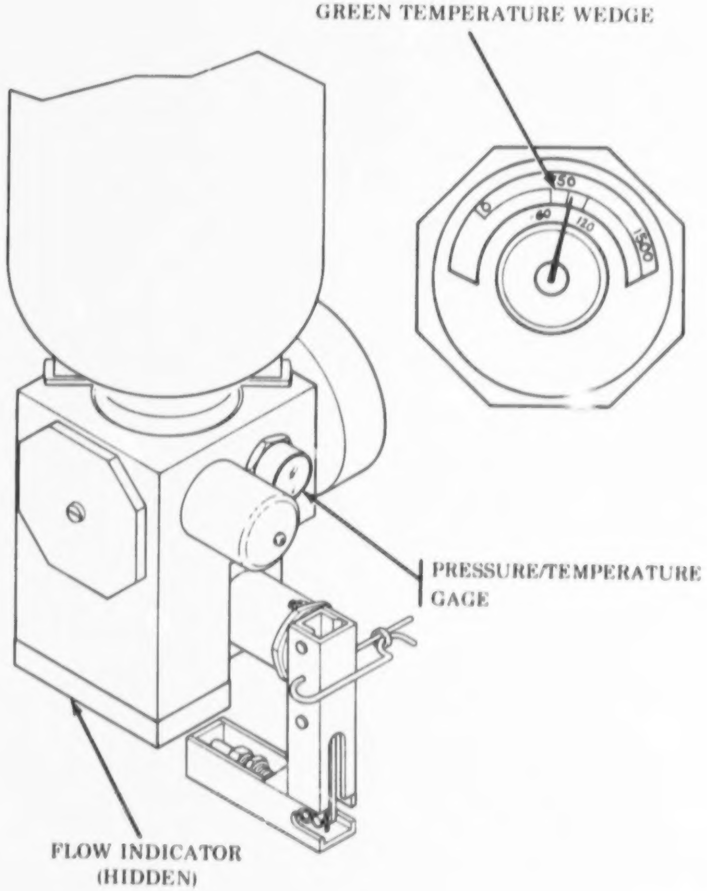




S Disconnect wiring harness 12351499 connector P1 from Standard Control Electronic Amplifier (SCEA) J3 and from OFSA's indicated by DET LED's. Using a multimeter, check continuity of harness circuits using the following as a guide:

FROM SCEA	TO OFSA(s)	REMARKS	
P1-A	P2-A	POWER 1	
P1-B	P2-B	RETURN	
P1-C	P2-C	LARGE FIRE	OFSA NO.1
P1-D	P2-D	SMALL FIRE	
P1-E	P2-E	BITE	
P1-J	P3-A	POWER 2	
P1-K	P3-B	RETURN	
P1-L	P3-C	LARGE FIRE	OFSA NO.2
P1-M	P3-D	SMALL FIRE	
P1-N	P3-E	BITE	
P1-T	P4-A	POWER 3	
P1-U	P4-B	RETURN	
P1-V	P4-C	LARGE FIRE	OFSA NO.3
P1-W	P4-D	SMALL FIRE	
P1-X	P4-E	BITE	
P1-B̲	P5-A	POWER 4	
P1-C̲	P5-B	RETURN	
P1-D̲	P5-C	LARGE FIRE	OFSA NO.4
P1-E̲	P5-D	SMALL FIRE	
P1-F̲	P5-E	BITE	

If continuity is not indicated, replace harness (p 14-42).

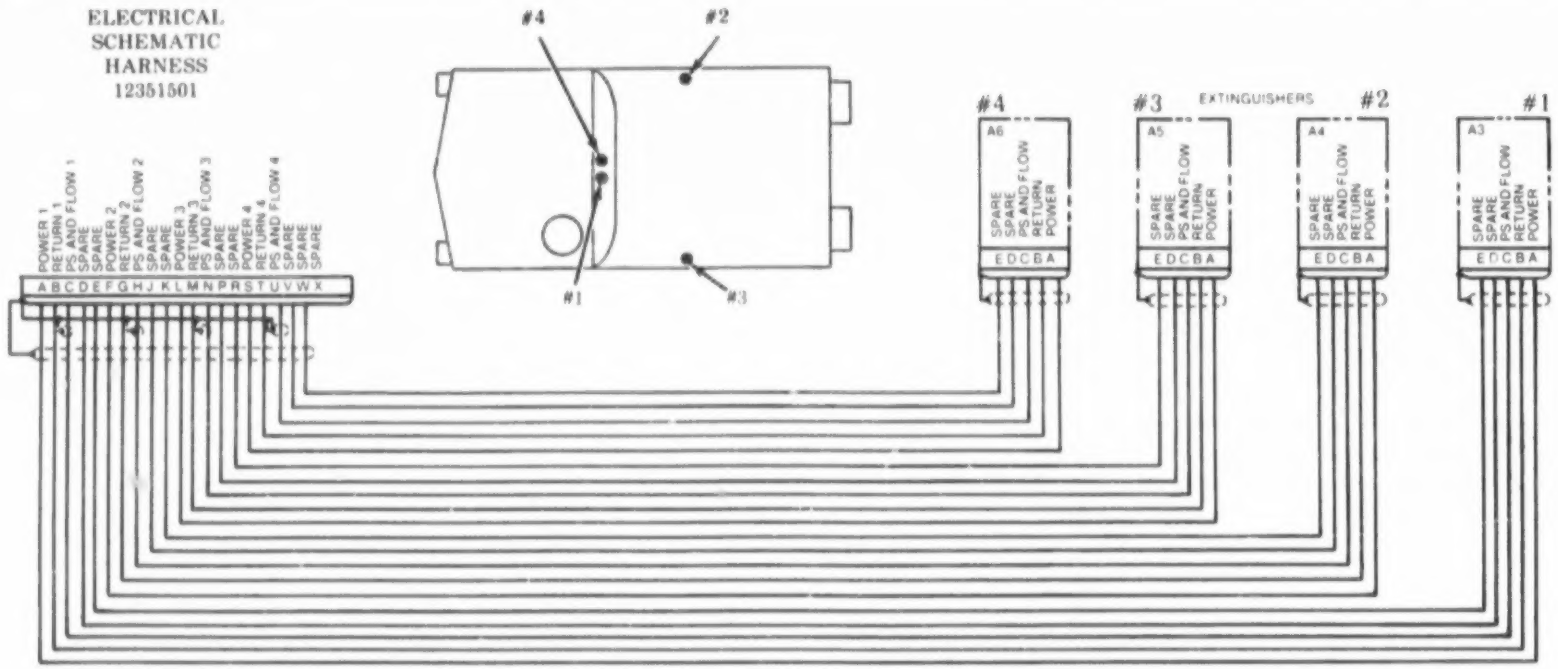

GREEN TEMPERATURE WEDGE
750
60
120
1500
PRESSURE/TEMPERATURE GAGE
FLOW INDICATOR (HIDDEN)

NOTE

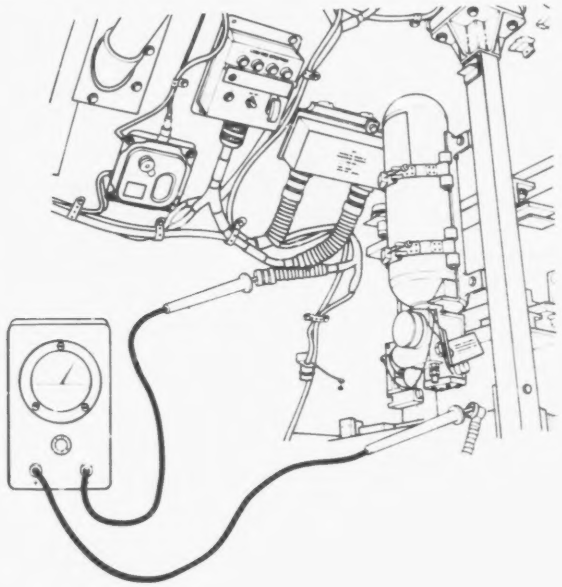
If FIRE EXT LED's are lit for crew extinguishers no.2 and/or no.3, removal of projectile racks is not required.

T Remove both right and left projectile racks (TM 9-2350-267-10). Check for protruding flow indicator of valve actuators of crew extinguishers no.1 thru no.4, as indicated by lit LED's. Check pressure gage of crew extinguishers. Black pointer of pressure gage must be on green temperature wedge. If pressure is correct, but flow indicator is protruding, reset flow indicator by pushing into valve body. Verify LED is no longer lit. If pressure is low, replace crew extinguisher, as indicated by lit LED's. If flow indicator is not protruding from valve, and pressure indicator is correct, go to step U.

ELECTRICAL SCHEMATIC HARNESS 12351501

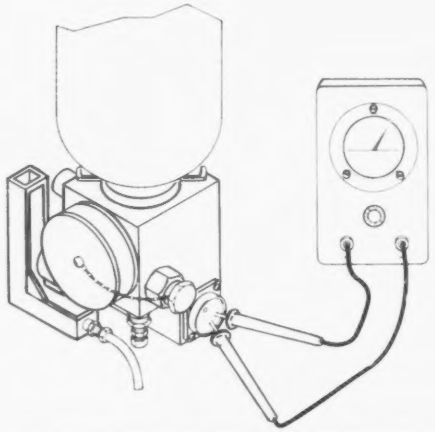

#4
#2
#1
#3
POWER 1
RETURN 1
PS AND FLOW 1
SPARE
SPARE
POWER 2
RETURN 2
PS AND FLOW 2
SPARE
SPARE
POWER 3
RETURN 3
PS AND FLOW 3
SPARE
SPARE
POWER 4
RETURN 4
PS AND FLOW 4
SPARE
SPARE
SPARE
A B C D E F G H J K L M N P R S T U V W X
EXTINGUISHERS
#4
A6
#3
A5
#2
A4
#1
A3
SPARE
SPARE
PS AND FLOW
RETURN
POWER
E D C B A

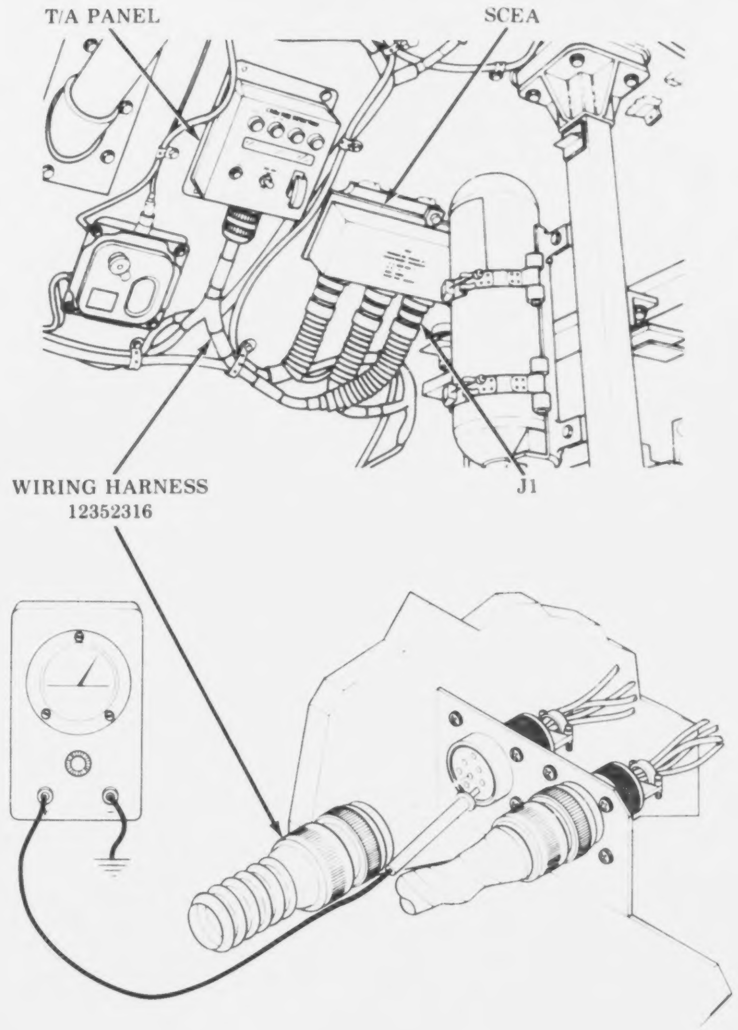
SCEA	EXTINGUISHER	REMARKS
P1-A	P2-A	POWER
P1-B	P2-B	RETURN EXTINGUISHER NO. 1
P1-C	P2-C	P/S AND FLOW
P1-F	P3-A	POWER
P1-G	P3-B	RETURN EXTINGUISHER NO. 2
P1-H	P3-C	P/S AND FLOW
P1-L	P4-A	POWER
P1-M	P4-B	RETURN EXTINGUISHER NO. 3
P1-N	P4-C	P/S AND FLOW
P1-S	P5-A	POWER
P1-T	P5-B	RETURN EXTINGUISHER NO. 4
P1-U	P5-C	P/S AND FLOW



U Disconnect harness 12351501 from SCEA J2, and disconnect harness 12351501 from actuator of defective extinguisher, as indicated by lit FIRE EXT LED's. Using a multimeter, check harness 12351501 circuits for continuity between SCEA plug and defective extinguisher plug. If no continuity in any one or all circuits, replace harness 12351501 (p 14-48). If continuity is indicated, go to step V.

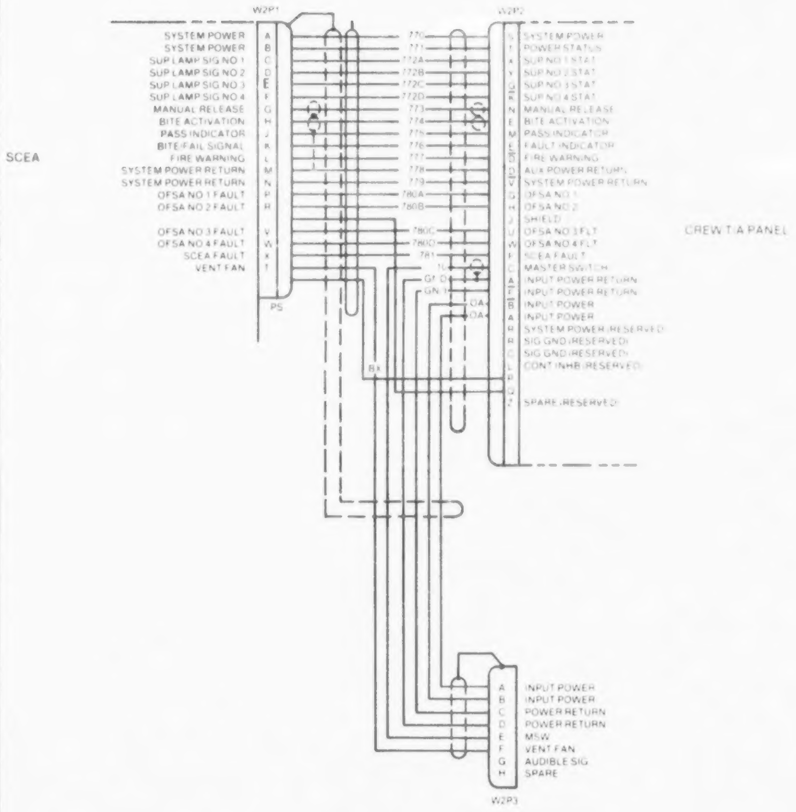
V Using a multimeter, check continuity between A-B and B-C of crew extinguisher(s) actuator at socket, as indicated by lit LED's. If no continuity is indicated, replace appropriate extinguisher (p 14-28.3). If continuity is indicated, replace SCEA (p 14-40).





W Disconnect wiring harness 12351498 for SCEA J1, crew T/A panel and connector W2P2. Using a multimeter, check continuity of harness circuits using the following as a guide:

FROM SCEA	TO CREW T/A PANEL	REMARKS
P1-A	P2-S	SYSTEM POWER
P1-B	P2-T	POWER STATUS
P1-C	P2-X	SUP NO. 1 STATUS
P1-D	P2-Y	SUP NO. 2 STATUS
P1-E	P2-g	SUP NO. 3 STATUS
P1-F	P2-K	SUP NO. 4 STATUS
P1-G	P2-N	MANUAL RELEASE
P1-H	P2-E	BITE ACTIVATION
P1-J	P2-M	PASS INDICATOR
P1-K	P2-e	BITE/FAIL SIGNAL
P1-L	P2-D	FIRE WARNING
P1-M	P2-d	SYSTEM POWER RETURN
P1-N	P2-V	SYSTEM POWER RETURN
P1-P	P2-G	OFSA NO. 1 FAULT


SCEA
W2P1
SYSTEM POWER A
SYSTEM POWER B
SUP LAMP SIG NO 1 C
SUP LAMP SIG NO 2 D
SUP LAMP SIG NO 3 E
SUP LAMP SIG NO 4 F
MANUAL RELEASE G
BITE ACTIVATION H
PASS INDICATOR J
BITE/FAIL SIGNAL K
FIRE WARNING L
SYSTEM POWER RETURN M
SYSTEM POWER RETURN N
OFSA NO 1 FAULT P
OFSA NO 2 FAULT R
OFSA NO 3 FAULT V
OFSA NO 4 FAULT W
SCEA FAULT X
VENT FAN T
PS
770
771
772A
772B
772C
772D
773
774
775
776
777
778
779
780A
780B
780C
780D
781
BX
OA
W2P2
SYSTEM POWER
POWER STATUS
SUP NO 1 STAT
SUP NO 2 STAT
SUP NO 3 STAT
SUP NO 4 STAT
MANUAL RELEASE
BITE ACTIVATION
PASS INDICATOR
FAULT INDICATOR
FIRE WARNING
AUX POWER RETURN
SYSTEM POWER RETURN
OFSA NO 1
OFSA NO 2
SHIELD
OFSA NO 3 FLT
OFSA NO 4 FLT
SCEA FAULT
MASTER SWITCH
INPUT POWER RETURN
INPUT POWER RETURN
INPUT POWER
INPUT POWER
SYSTEM POWER (RESERVED)
SIG GND (RESERVED)
SIG GND (RESERVED)
CONT INHB (RESERVED)
SPARE (RESERVED)
CREW T/A PANEL
A INPUT POWER
B INPUT POWER
C POWER RETURN
D POWER RETURN
E MSW
F VENT FAN
G AUDIBLE SIG
H SPARE
W2P3

ELECTRICAL SCHEMATIC
HARNESS 12351498

FROM SCEA	TO CREW T/A PANEL	REMARKS
P1-R	P2-H	OFSA NO. 2 FAULT
P1-V	P2-U	OFSA NO. 3 FAULT
P1-W	P2-W	OFSA NO. 4 FAULT
P1-X	P2-F	SCEA FAULT

FROM SCEA	TO TO W3P3	REMARKS
P1-T	P3-F	VENT FAN

FROMT/A PANEL	TO W2P3	REMARKS
P2-C	P3-E	MASTER SWITCH
P2-a	P3-D	INPUT POWER RETURN
P2-f	P3-C	INPUT POWER RETURN
P2-B	P3-B	INPUT POWER
P2-A	P3-A	INPUT POWER

If continuity is not indicated at all test points, replace harness 12352316 (p 14-52.4). If continuity is indicated at all test points, replace SCEA.

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM FIRE DETECTION TEST AND ALARM PANEL INDICATORS (EFFECTIVE FOR VEHICLES 345 AND ABOVE)	**POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON** Do steps A thru Q **FAULT LAMP REMAINS ON** Go to step R

START HERE

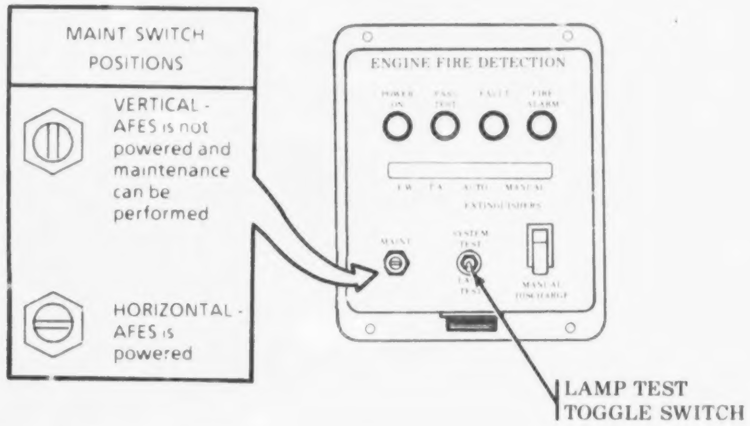
Before troubleshooting AFES, check the following:

1 Make sure MASTER switch is ON.

2 Make sure engine T/A panel MAINTenance switch is turned to horizontal position.

NOTE

Use flat-tip screwdriver to rotate MAINTenance switch.


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
POWER ON
FAULT
FIRE ALARM
F.W.
T.A.
AUTO
MANUAL
EXTINGUISHERS
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE
LAMP TEST TOGGLE SWITCH

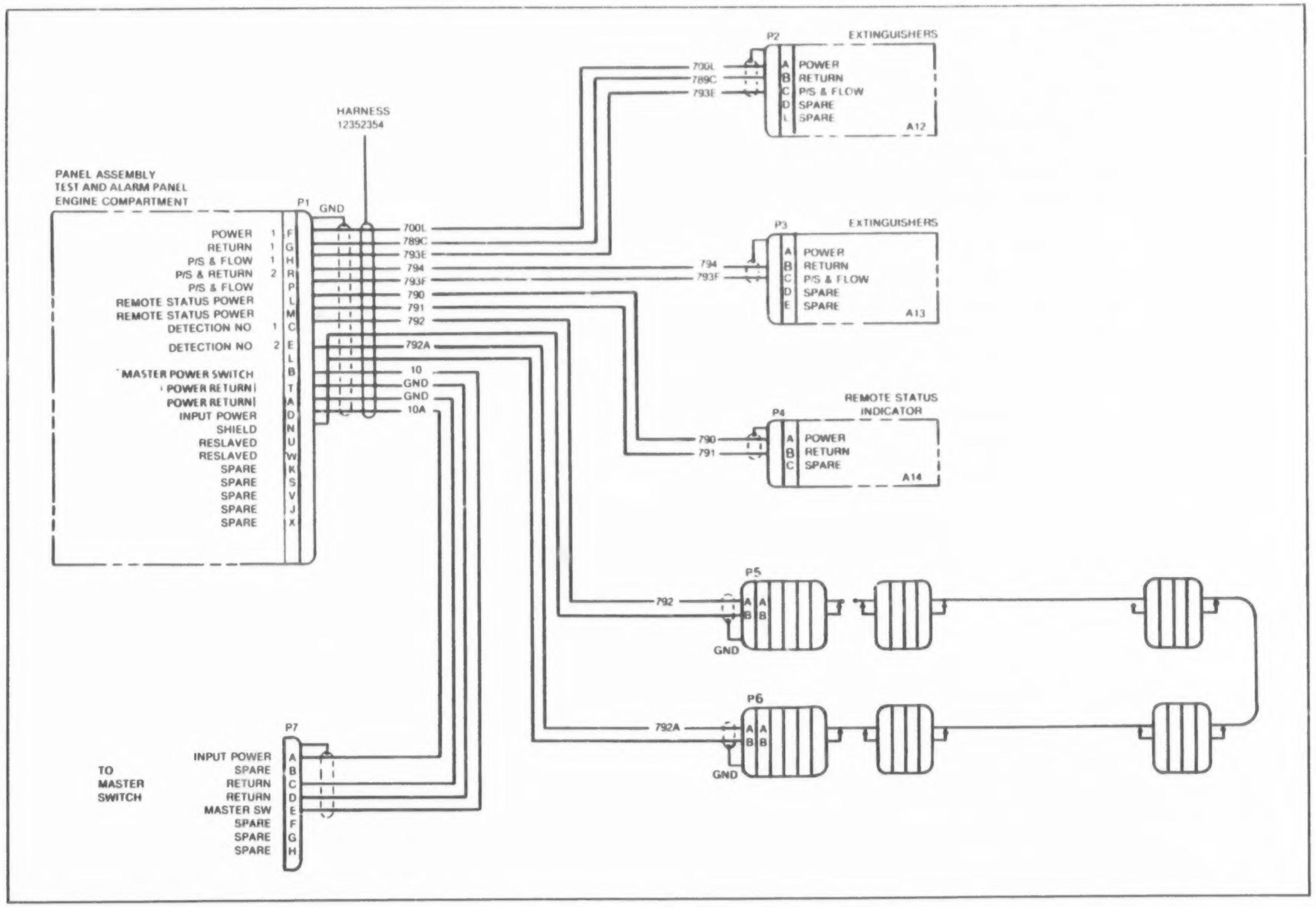
A Press LAMP TEST toggle switch to check for defective bulb. Replace defective bulbs.

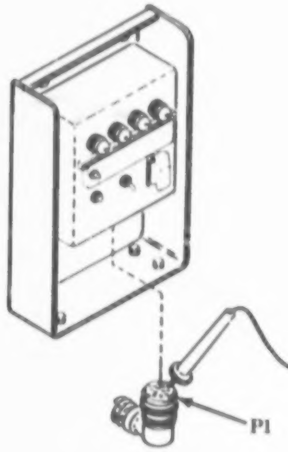
B If lamps on engine T/A panel do not operate when MASTER switch is turned ON, check battery charge. If charge is low, service batteries in accordance with TM 9-6140-200-14 or replace batteries (p 6-44). If batteries are good, go to step D.

WARNING

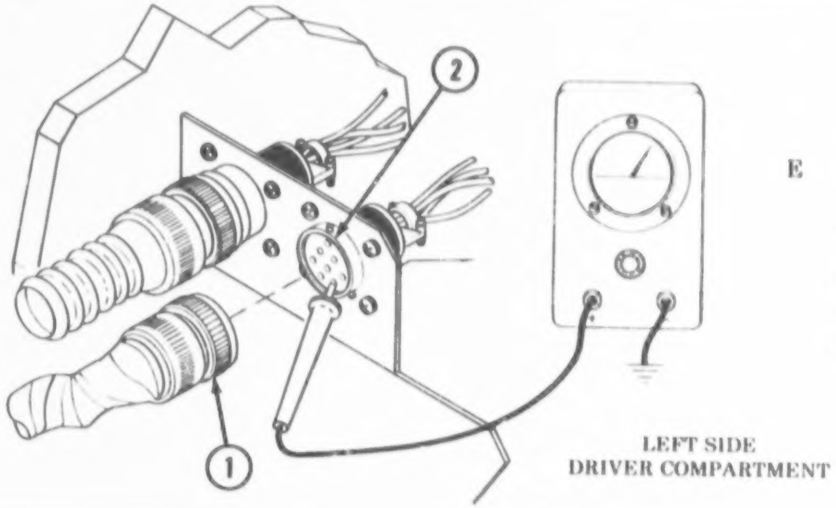
Turn engine T/A panel MAINTenance switch to vertical position before disconnecting any electrical wiring harnesses. Failure to comply may result in discharge of extinguisher cylinder(s) and injury to personnel.

C Turn engine T/A panel MAINTenance switch to vertical position.

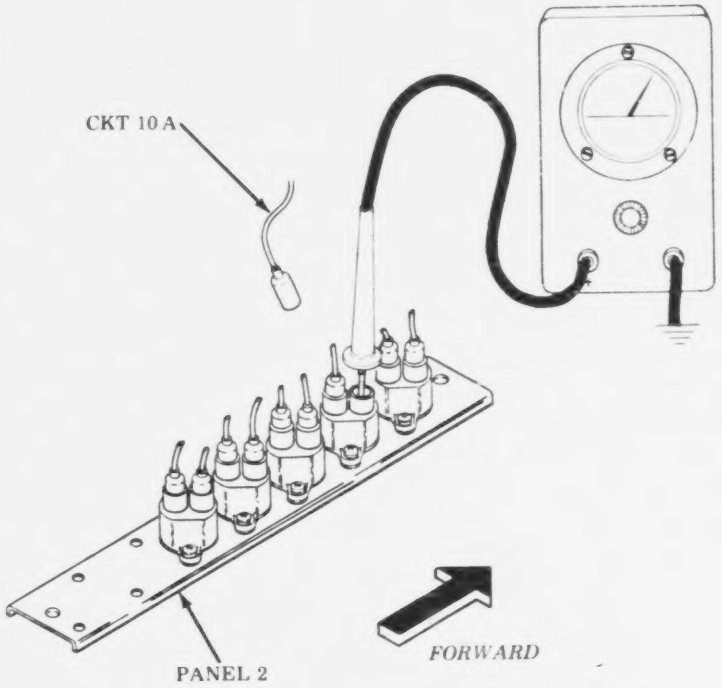

HARNESS
12352354
PANEL ASSEMBLY
TEST AND ALARM PANEL
ENGINE COMPARTMENT
P1
GND
POWER 1 F
RETURN 1 G
P/S & FLOW 1 H
P/S & RETURN 2 R
P/S & FLOW P
REMOTE STATUS POWER L
REMOTE STATUS POWER M
DETECTION NO 1 C
DETECTION NO 2 E
L
MASTER POWER SWITCH B
POWER RETURN T
POWER RETURN A
INPUT POWER D
SHIELD N
RESLAVED U
RESLAVED W
SPARE K
SPARE S
SPARE V
SPARE J
SPARE X
700L
789C
793E
794
793F
790
791
792
792A
10
GND
GND
10A
P2
EXTINGUISHERS
A POWER
B RETURN
C P/S & FLOW
D SPARE
L SPARE
A12
P3
EXTINGUISHERS
A POWER
B RETURN
C P/S & FLOW
D SPARE
E SPARE
A13
P4
REMOTE STATUS
INDICATOR
A POWER
B RETURN
C SPARE
A14
P5
792
A A
B B
GND
P6
792A
A A
B B
GND
P7
TO
MASTER
SWITCH
INPUT POWER A
SPARE B
RETURN C
RETURN D
MASTER SW E
SPARE F
SPARE G
SPARE H



D Disconnect wire harness 12352354 connector P1 from engine T/A panel. Place red probe of multimeter in pin socket D of wire harness 12352354 and ground black probe. Check for voltage. If voltage is indicated, go to step H. If no voltage is indicated, go to step E.



E Reconnect wire harness 12352354 connector P1 to engine T/A panel. Disconnect wire harness 12352354 connector P7 (1) from bracket-mounted socket (2) of harness 12351461. Place red probe of multimeter in pin socket A and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12352354 (p 14-52.12). If no voltage is indicated, go to step F.



WARNING

Circuit 10A, if functioning properly, is a live circuit carrying a constant 24 volts. Exercise proper precautions when working with this circuit. Failure to do so may result in personal injury or equipment damage.

F Reconnect wire harness 12352354. Disconnect wiring harness 12351461, circuit 10A from number 6 positioned circuit breaker, panel no. 2 (located on sponson, directly behind engine T/A panel). Place red probe of multimeter in circuit breaker and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12351461. If no voltage is indicated, go to step G.

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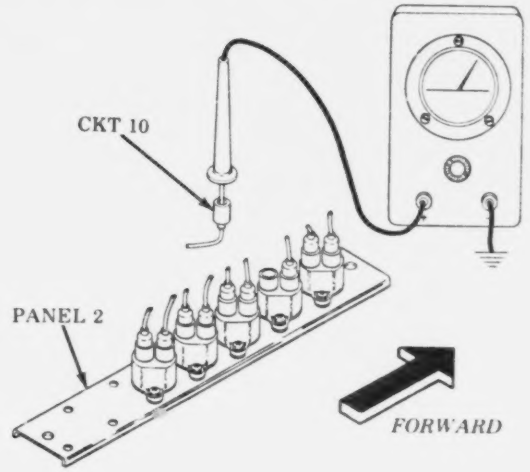
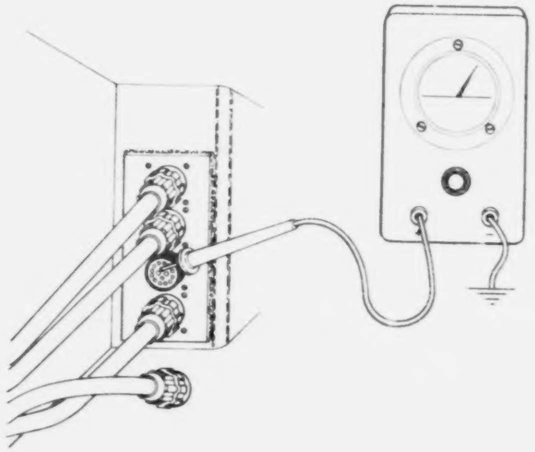
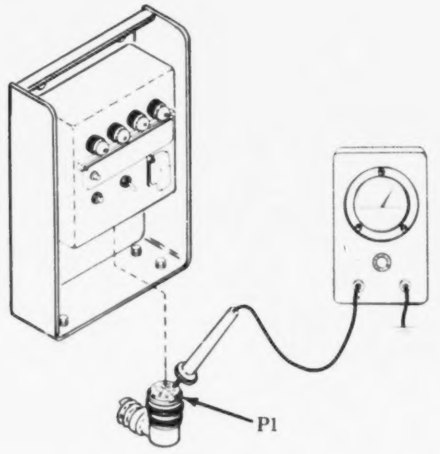


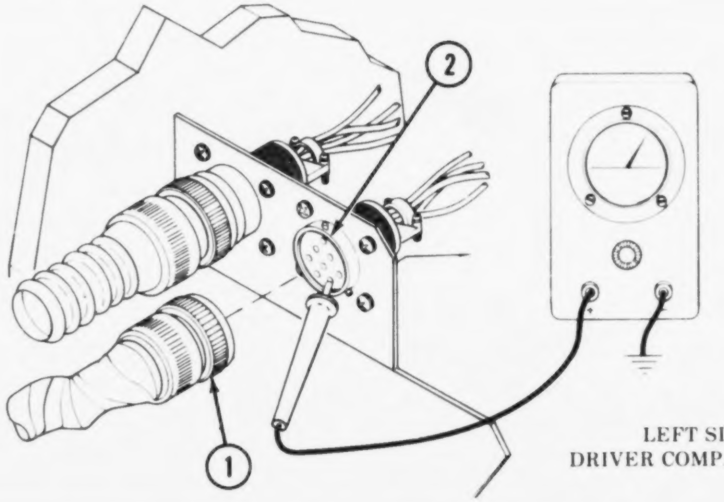
G Reconnect wire harness 12351461, circuit 10A to number 6 positioned circuit breaker, panel no. 2. Disconnect wire harness 12351461, circuit 10A to number 6 positioned circuit breaker, panel no. 2. Disconnect harness 12351754, circuit 10 from number 6 positioned circuit breaker. Place red probe of multimeter in circuit 10 connector and ground black probe. Check for voltage. If voltage is indicated, replace circuit breaker 6 (p 6-54). If no voltage is indicated, go to step H.



H Reconnect harness 12351754. Disconnect wiring harness 12260287 at bulkhead, place red probe on connector pin socket S of harness 12268100 and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12260287 (p 6-84). If no voltage is indicated, troubleshoot harness 12268100 (p 6-68).

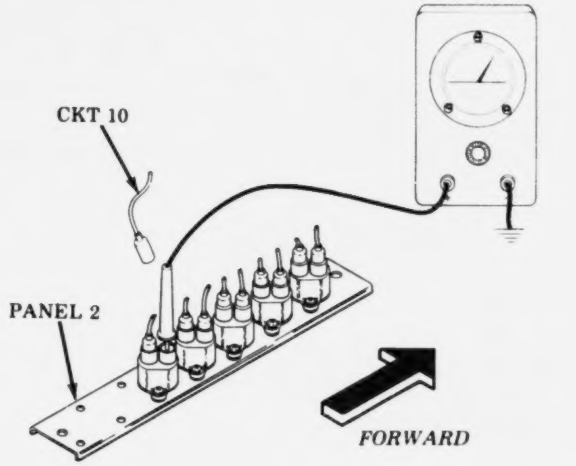


I Reconnect wire harness 12260287 at bulkhead. Disconnect wire harness 12352354 connector P1 from engine T/A panel. Place multimeter red probe on pin socket B of harness connector and ground black probe. Check for voltage. If voltage is indicated, replace engine T/A panel (p 14-39). If no voltage is indicated, go to step J.

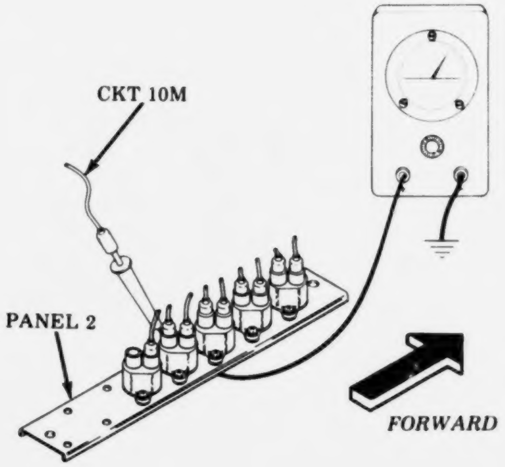


LEFT SIDE
DRIVER COMPARTMENT

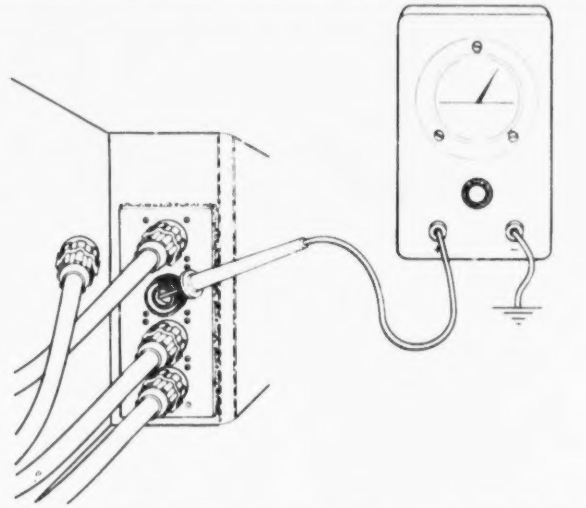
J Reconnect wire harness 12352354 connector P1 to engine T/A panel. Disconnect harness 12352354 connector P7 (1) from bracket-mounted socket (2) of harness 12351461. Place multimeter red probe in pin socket E and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12352354 (p 14-52.12). If no voltage is indicated, go to step K.



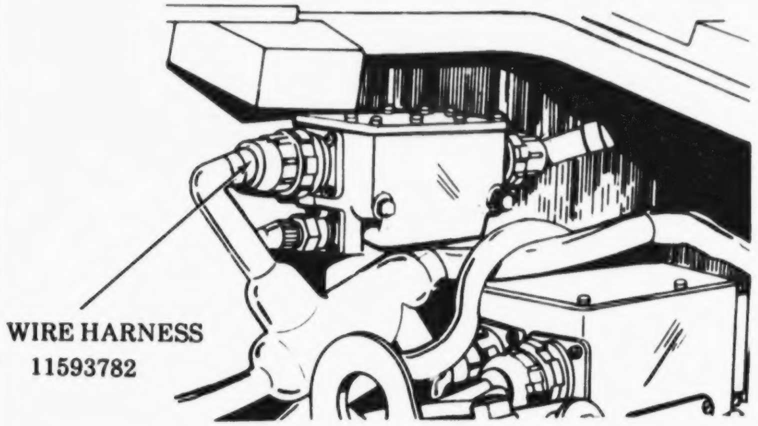
K Reconnect wire harness 12352354 connector P7 to bracket-mounted socket of harness 12351461. Disconnect wire harness 12351461, circuit 10 from number 3 positioned circuit breaker, panel no. 2. Place red probe of multimeter in circuit breaker socket and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12351461, circuit 10 (p 6-93). If no voltage is indicated, go to step L.



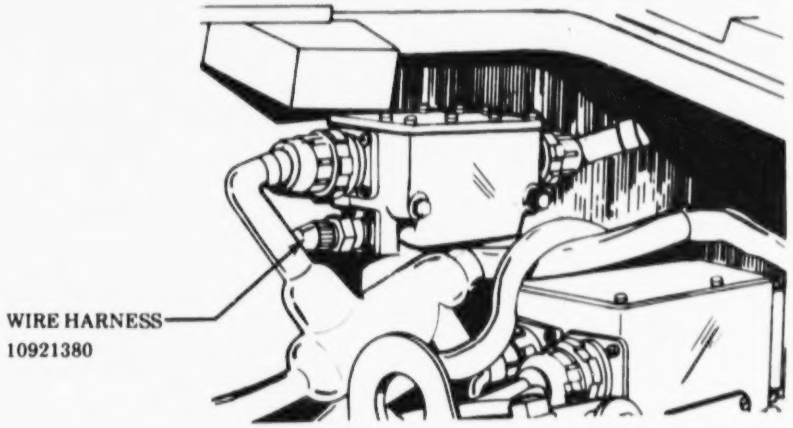
L Reconnect wire harness 12351461, circuit 10 to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 circuit 10M from number 3 positioned circuit breaker. Place red probe of multimeter in circuit 10M and ground black probe. Check for voltage. If voltage is indicated, replace 15 amp circuit breaker. If no voltage is indicated, go to step M.



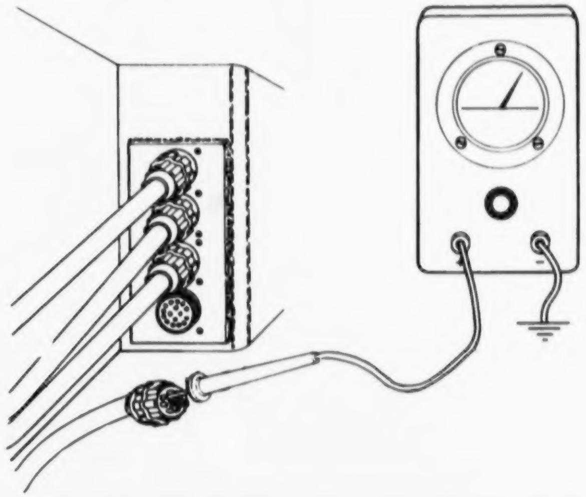
M Reconnect wire harness 12330257 circuit 10M to number 3 positioned circuit breaker. Disconnect wire harness 12330257 at bulkhead. Place red probe of multimeter in pin socket 49 of wire harness 11593782 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 12330257. If no voltage is indicated, go to step N.



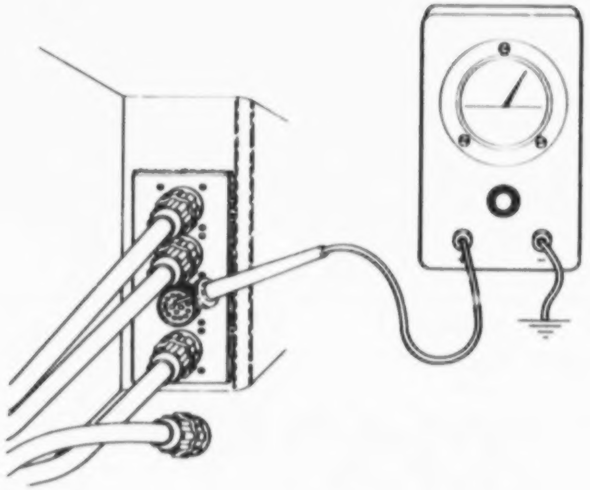
N Reconnect wire harness 12330257 at bulkhead. Disconnect wire harness 11593782 at master relay. Place red probe of multimeter in connector 82 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 11593782. If no voltage is indicated, go to step O.



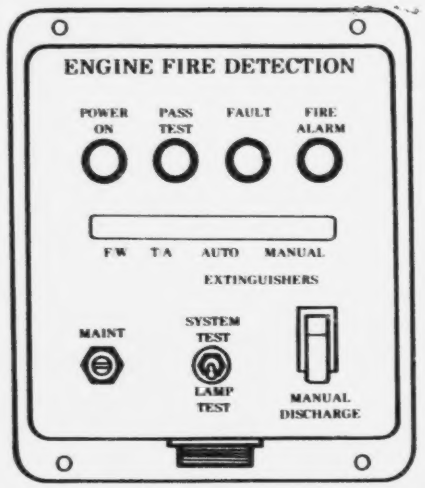
O Reconnect wire harness 11593782 at master relay. Disconnect wire harness 10921380 at master relay. Place red probe of multimeter in connector 459 and ground black probe. Check for voltage. If voltage is indicated, repair or replace master relay. If no voltage is indicated, go to step P.



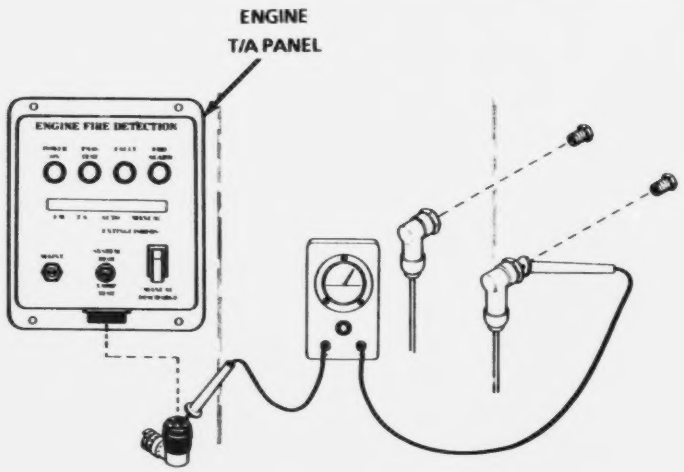
P Reconnect wire harness 10921380 at master relay. Disconnect wire harness 12330252 at bulkhead. Place red probe of multimeter in pin H of wire harness 10921380 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 10921380. If no voltage is indicated, go to step Q.



Q Reconnect wire harness 12330252 at bulkhead. Disconnect wire harness 12260287 at bulkhead. Place red probe of multimeter on pin socket B of wire harness 12268100 and ground black probe. Check for voltage. If no voltage is indicated, repair or replace wire harness 12268100. If voltage is indicated, go to step R.


ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
F/W
T/A
AUTO
MANUAL
EXTINGUISHERS
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

R Check status LED's of engine T/A panel. If F/W LED is lit, troubleshoot engine compartment thermal sensing elements, step T. If T/A LED is lit, replace engine T/A panel (p 14-39). If AUTO LED is lit, go to step Y. If MANUAL LED is lit, go to step AB.

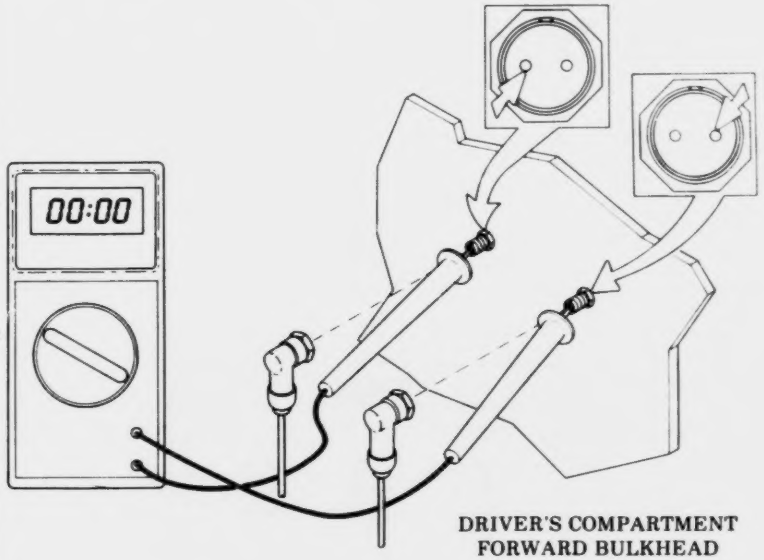

ENGINE
T/A PANEL
ENGINE FIRE DETECTION

S **Turn engine T/A panel MAINTenance switch to vertical position. Disconnect harness 12352354 connector P1 from engine T/A panel and disconnect two harness connectors (P5 and P6) from bulkhead connectors (directly in front of driver). Check circuit continuity between connectors and plug:**

Connector P1	Connector P5
Pin C	A
Pin N	B

Connector P1	Connector P6
Pin E	A
Pin N	B

If there is no continuity in any one or all circuits, replace harness 12352354 (p 14-52.12). If continuity is indicated between all of the above points, go to step T.



DRIVER'S COMPARTMENT
FORWARD BULKHEAD

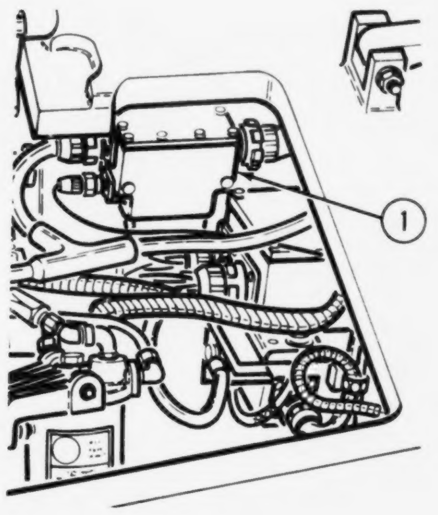
CAUTION

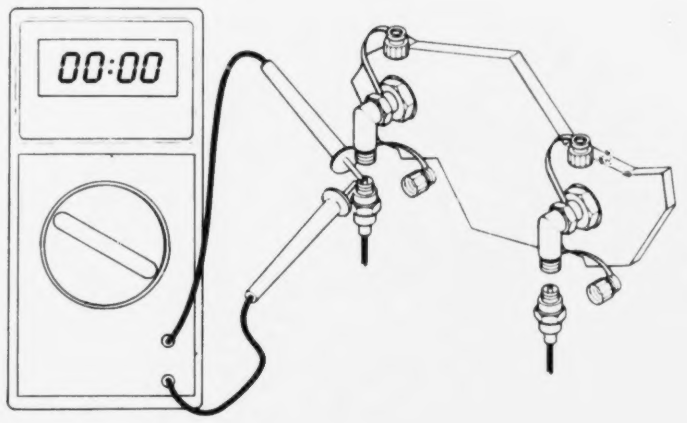
Digital multimeter (DMM) must not be operated any longer than is necessary to obtain reading. Misleading improvements in resistance readings could result.

NOTE

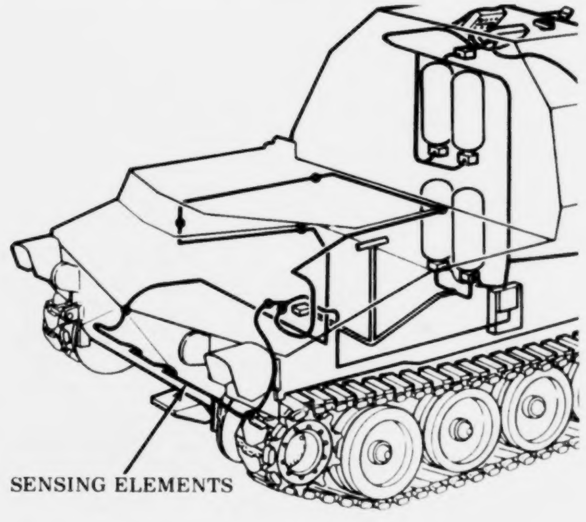
Use a DMM for following tests. Do not use a standard VOLT/OHM METER (VOM); its method of operation will not give accurate indications.

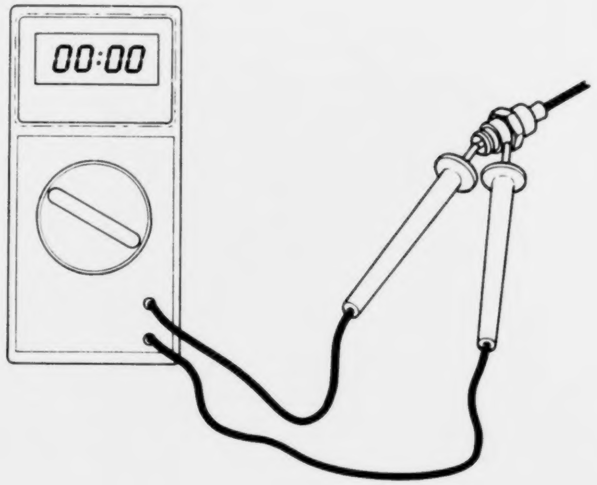
T Using a DMM as shown, check resistance of outside wire of complete loop of thermal sensing elements. Resistance must be more than 95 ohms, but less than 180.5 ohms. If resistance indicated is outside limits, go to step X. If resistance indicated is correct, go to step U.





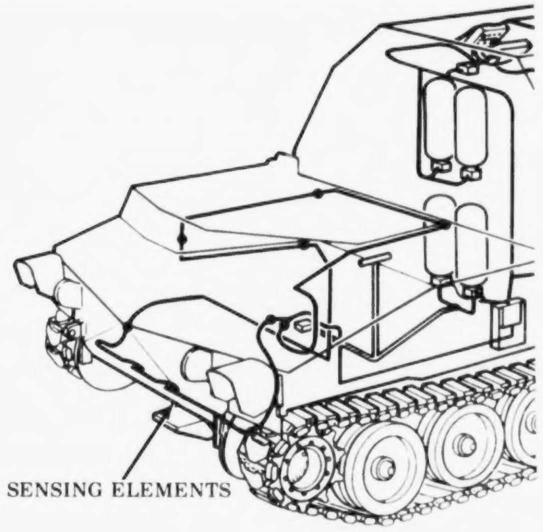
U Open left transmission door and forward battery door. Support doors in open position. Remove lead 81 from relay (1). Disconnect two thermal wire connectors from 90-degree elbows. Using a DMM, range must be greater than 1 megohm. Measure the insulation resistance between center wire and outer sheath of complete loop of connected thermal sensing element. If the multimeter reading is 00, replace engine T/A panel (p 14-39). If resistance indicated is less than 1 megohm, go to step V.

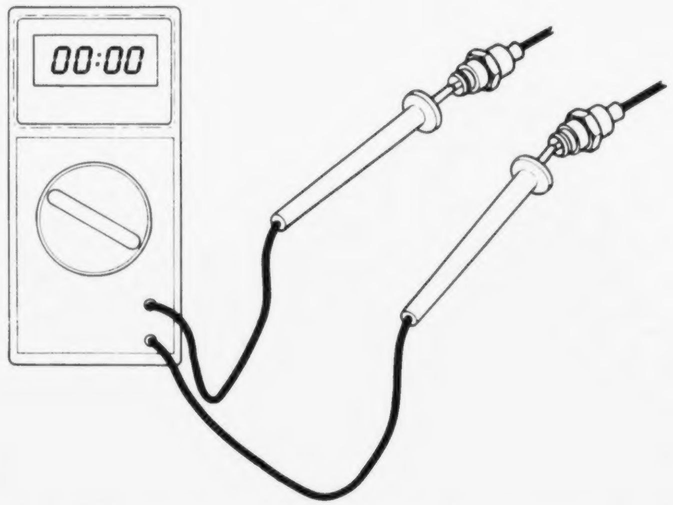




V Open engine grille door and disconnect all sensing elements from couplings (p 14-27).

W Using a DMM, measure resistance between center wire and outer sheath of each of five sensing elements and six couplings separately until fault is located. Resistance of each item must be greater than 2 kilohms. Replace any defective component (p 14-15 thru p 14-27).





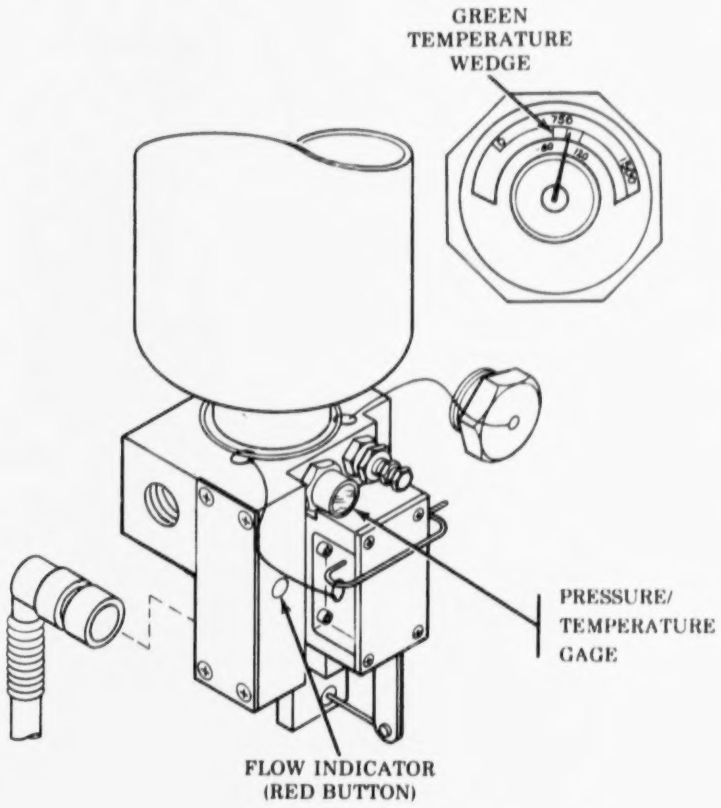
NOTE

Sixty-inch elements are installed at underside of engine deck, above the engine.

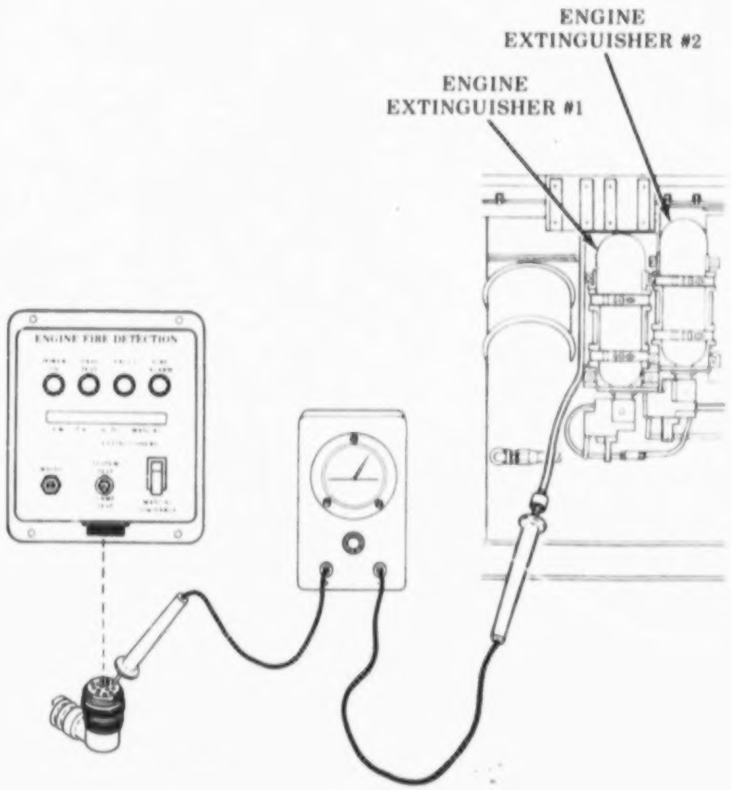
X Using a DMM, measure resistance of center wire of each of five elements and six couplings separately until fault is located. Resistance of sensing elements must fall within following parameters.

SENSING ELEMENT LENGTH	MIN OHMS	MAX OHMS
150"	25.0	37.5
60"	10.0	30.0
COUPLING	0.0	1.0

Replace any defective component (p 14-15 thru p 14-27).


GREEN
TEMPERATURE
WEDGE
750
15
-60
150
1500
PRESSURE/
TEMPERATURE
GAGE
FLOW INDICATOR
(RED BUTTON)

Y Remove left projectile rack (TM 9-2350-267-10). Check for protruding flow indicator of valve actuator of engine extinguisher no. 1. Check pressure gage of engine extinguisher no. 1. Black pointer of pressure gage must be on green temperature wedge. If pressure is correct, but flow indicator is protruding, reset flow indicator by pushing into valve body. If pressure is low, replace engine extinguisher no. 1. If indicator is not protruding from valve, and pressure gage is correct, go to step Z.


ENGINE EXTINGUISHER #2
ENGINE EXTINGUISHER #1
ENGINE FIRE DETECTION

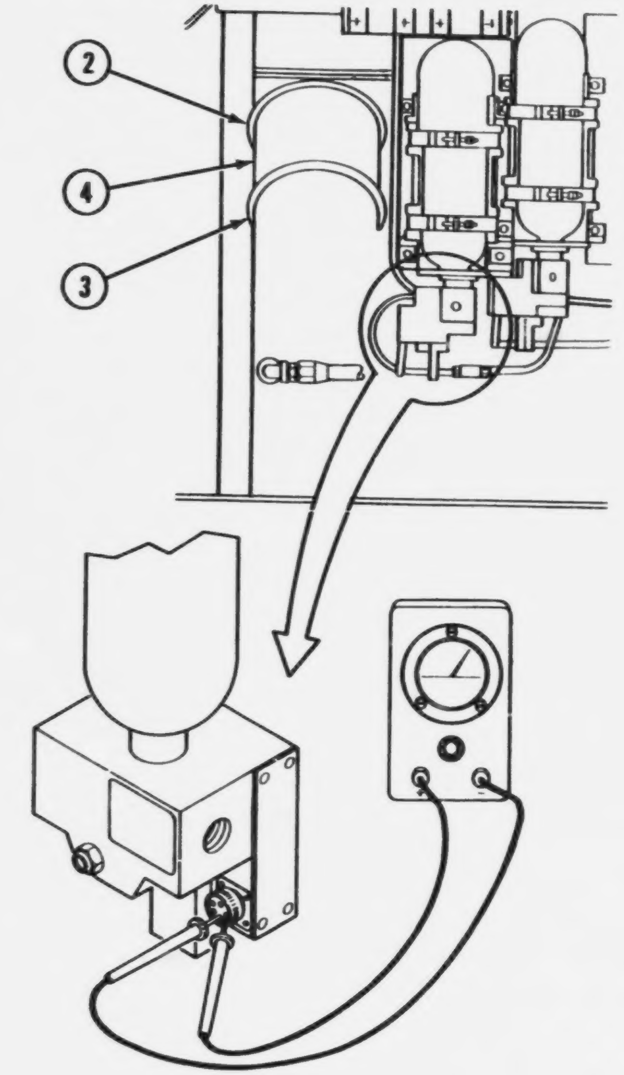
WARNING

Make sure engine T/A panel MAINTenance switch is in vertical position. Failure to comply may result in cylinder discharge, and injury to personnel.

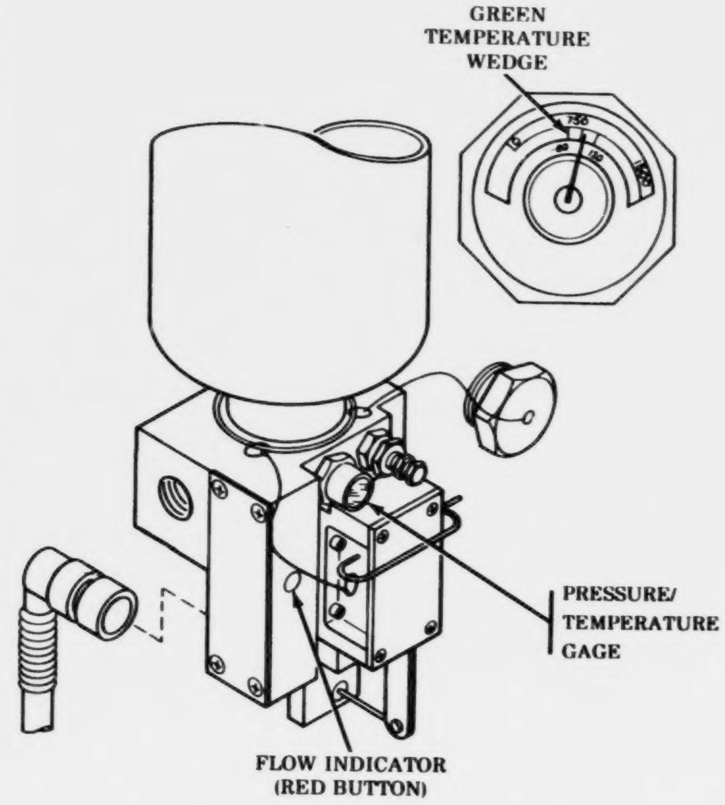
Z Disconnect harness 12352354 connector P1 from engine T/A panel and connector P2 from valve actuator of engine extinguisher no. 1. Using a multimeter, check continuity as follows:

T/A PANEL CONNECTOR P1	EXTINGUISHER CONNECTOR P2
Pin F	Pin A
Pin G	Pin B
Pin H	Pin C

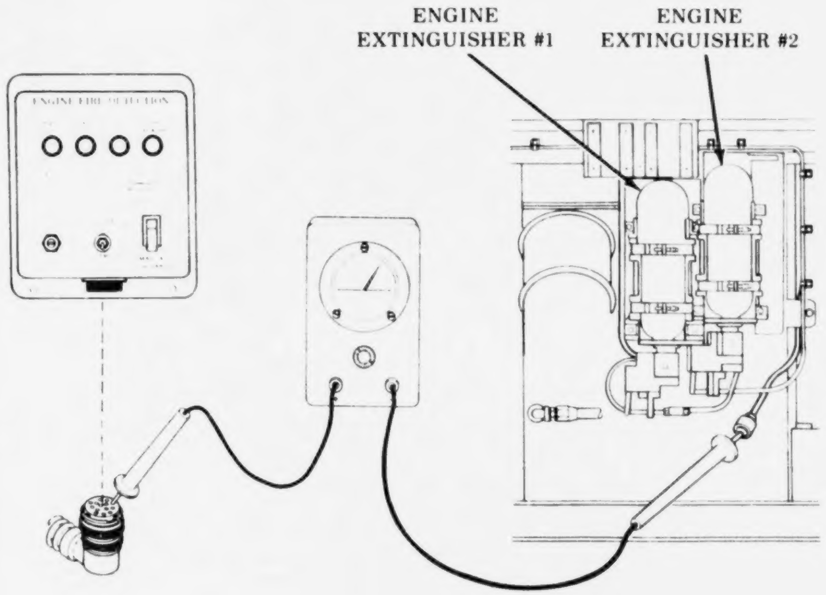
If there is no continuity in any one or all circuits, replace harness 12352354 (p 14-52.12). If continuity is indicated, go to step AA.



AA If necessary for access, loosen clamps (2 and 3), and remove ventilation duct hose (4). Using a multimeter, check continuity between pins A-B and B-C of engine extinguisher no. 1 actuator socket. If no continuity is indicated, replace engine extinguisher no. 1 (p 14-28). If continuity is indicated, replace engine T/A panel (p 14-39).


GREEN TEMPERATURE WEDGE
15
750
60
130
1000
PRESSURE/ TEMPERATURE GAGE
FLOW INDICATOR (RED BUTTON)

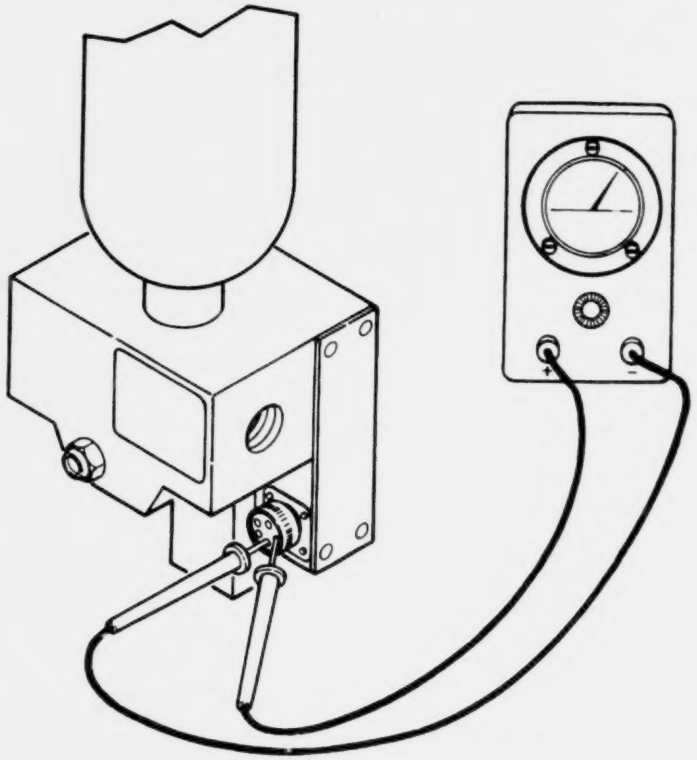
AB Remove left projectile rack (TM 9-2350-267-10). Check for protruding flow indicator of valve actuator of engine extinguisher no. 2. If necessary for access, loosen clamps (2 and 3) and remove ventilation duct hose (4). Check pressure gage of engine extinguisher no. 2. Black pointer of pressure gage must be on green temperature wedge. If pressure is correct,but flow indicator is protruding, reset flow indicator by pushing into valve body. If pressure is low, replace engine extinguisher no. 2 (p 14-28). If flow indicator is not protruding from valve, and pressure gage is correct, go to step AC.


ENGINE
EXTINGUISHER #1
ENGINE
EXTINGUISHER #2

AC Disconnect harness 12352354 connector P1 from engine T/A panel and plug P3 from valve actuator of engine extinguisher no. 2. Using a multimeter, check continuity as follows:

T/A PANEL CONNECTOR P1	EXTINGUISHER CONNECTOR P3
Pin R	Pin B
Pin P	Pin C

If no continuity in any one or all circuits, replace harness 12352354 (p 14-52.12). If continuity is indicated, go to step AD.



AD Remove right projectile rack (TM 9-2350-267-10). Using a multimeter, check continuity between circuits B-C of engine extinguisher no. 2 actuator socket. If no continuity is indicated, replace engine extinguisher no. 2 (p 14-28). If continuity is indicated, replace engine T/A panel (p 14-39).

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM FIRE DETECTION TEST AND ALARM PANEL INDICATORS (EFFECTIVE FOR VEHICLES 345 AND ABOVE)	**POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED ON Do steps A thru Q FAULT LAMP REMAINS ON Go to step R**

START HERE

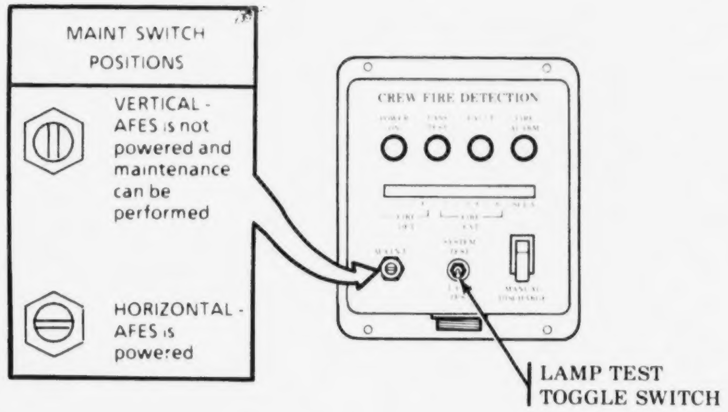
Before troubleshooting AFES, check the following:

1 Make sure MASTER switch is ON.

2 Make sure crew T/A panel MAINTenance switch is turned to horizontal position.

NOTE

Use flat-tip screwdriver to rotate MAINTenance switch.


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
LAMP TEST TOGGLE SWITCH

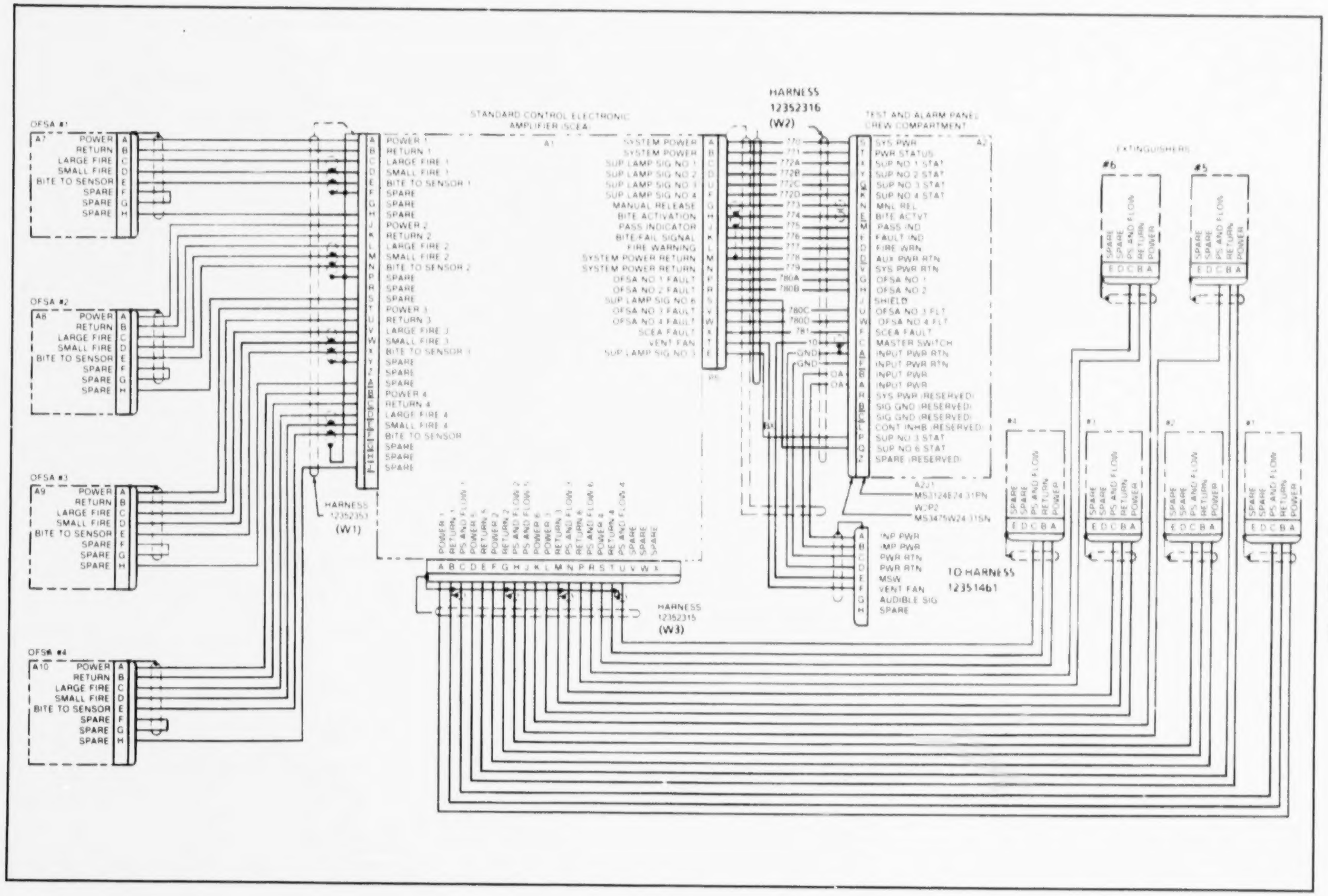
A Press LAMP TEST toggle switch to check for defective bulb. Replace defective bulbs.

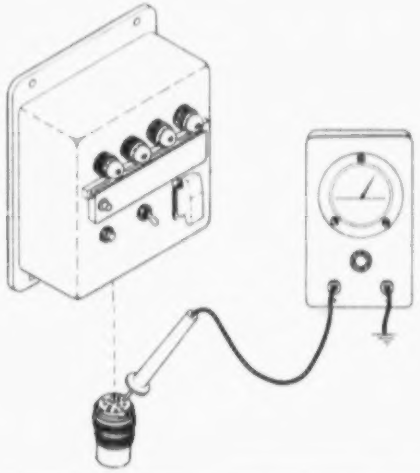
B If lamps on crew T/A panel do not operate when MASTER switch is turned ON, check battery charge. If charge is low, service batteries in accordance with TM 9-6140-200-14 or replace batteries (p 6-44). If batteries are good, go to step D.

WARNING

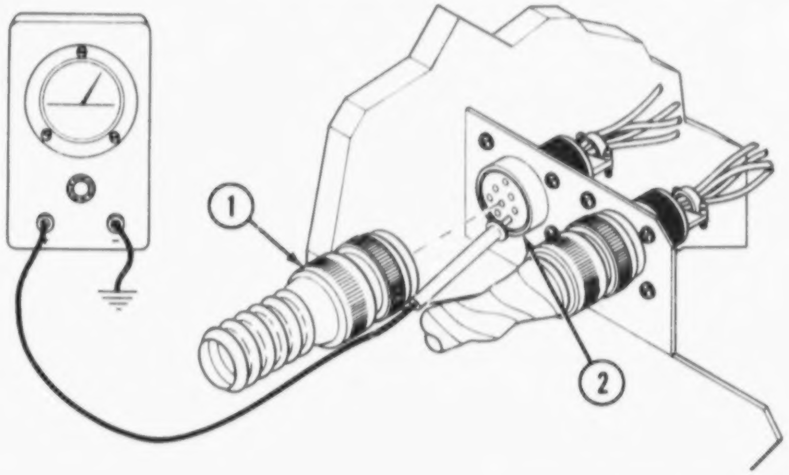
Turn crew T/A panel MAINTenance switch to vertical position before disconnecting any electrical wiring harnesses. Failure to comply may result in discharge of extinguisher cylinder(s) and injury to personnel.

C Turn crew T/A panel MAINTenance switch to vertical position.

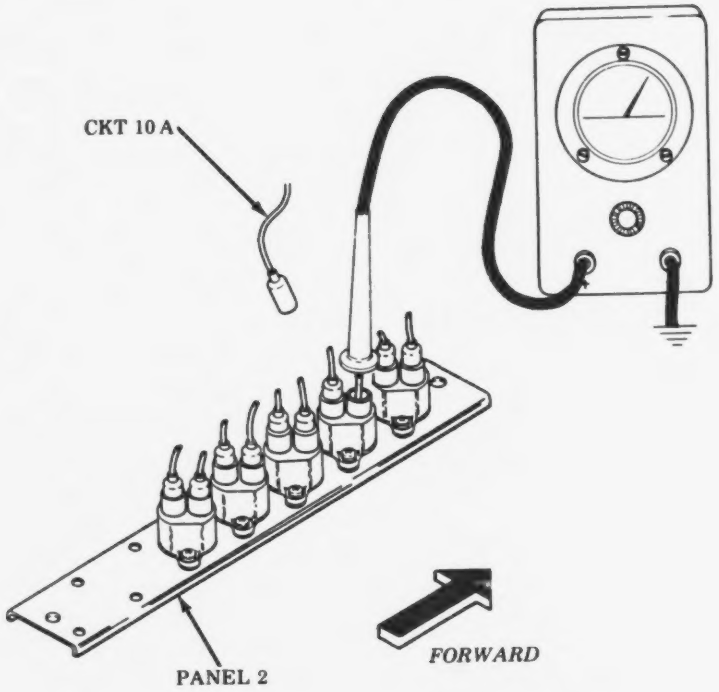
OFSA #1
A7
POWER
RETURN
LARGE FIRE
SMALL FIRE
BITE TO SENSOR
SPARE
OFSA #2
A8
OFSA #3
A9
OFSA #4
A10
HARNESS
12352353
(W1)
STANDARD CONTROL ELECTRONIC AMPLIFIER (SCEA)
A1
POWER 1
RETURN 1
LARGE FIRE 1
SMALL FIRE 1
BITE TO SENSOR 1
POWER 2
RETURN 2
LARGE FIRE 2
SMALL FIRE 2
BITE TO SENSOR 2
POWER 3
RETURN 3
LARGE FIRE 3
SMALL FIRE 3
BITE TO SENSOR 3
POWER 4
RETURN 4
LARGE FIRE 4
SMALL FIRE 4
BITE TO SENSOR
SYSTEM POWER
SUP LAMP SIG NO 1
SUP LAMP SIG NO 2
SUP LAMP SIG NO 3
SUP LAMP SIG NO 4
MANUAL RELEASE
BITE ACTIVATION
PASS INDICATOR
BITE/FAIL SIGNAL
FIRE WARNING
SYSTEM POWER RETURN
OFSA NO 1 FAULT
OFSA NO 2 FAULT
SUP LAMP SIG NO 6
OFSA NO 3 FAULT
OFSA NO 4 FAULT
SCEA FAULT
VENT FAN
SUP LAMP SIG NO 3
P5
HARNESS
12352316
(W2)
770
771
772A
772B
772C
772D
773
774
775
776
777
778
779
780A
780B
780C
780D
781
10
GND
OA
TEST AND ALARM PANEL
CREW COMPARTMENT
A2
SYS PWR
PWR STATUS
SUP NO 1 STAT
SUP NO 2 STAT
SUP NO 3 STAT
SUP NO 4 STAT
MNL REL
BITE ACTVT
PASS IND
FAULT IND
FIRE WRN
AUX PWR RTN
SYS PWR RTN
OFSA NO 1
OFSA NO 2
SHIELD
OFSA NO 3 FLT
OFSA NO 4 FLT
SCEA FAULT
MASTER SWITCH
INPUT PWR RTN
INPUT PWR
SYS PWR (RESERVED)
SIG GND (RESERVED)
CONT INHB (RESERVED)
SUP NO 3 STAT
SUP NO 6 STAT
SPARE (RESERVED)
A2J1
MS3124E24-31PN
W2P2
MS3475W24-31SN
INP PWR
PWR RTN
MSW
VENT FAN
AUDIBLE SIG
TO HARNESS
12351461
POWER 1
RETURN 1
PS AND FLOW 1
POWER 5
RETURN 5
POWER 2
RETURN 2
PS AND FLOW 2
PS AND FLOW 5
POWER 6
POWER 3
RETURN 3
PS AND FLOW 3
RETURN 6
PS AND FLOW 6
POWER 4
RETURN 4
PS AND FLOW 4
A B C D E F G H J K L M N P R S T U V W X
HARNESS
12352315
(W3)
EXTINGUISHERS
#6
#5
#4
#3
#2
#1
SPARE
PS AND FLOW
RETURN
POWER
E D C B A



D Disconnect wire harness 12352316 from crew T/A panel. Place red probe of multimeter in pin socket A of harness and ground black probe. Check for voltage. Check pin B for voltage. If voltage is indicated, go to step I. If no voltage is indicated, go to step E.



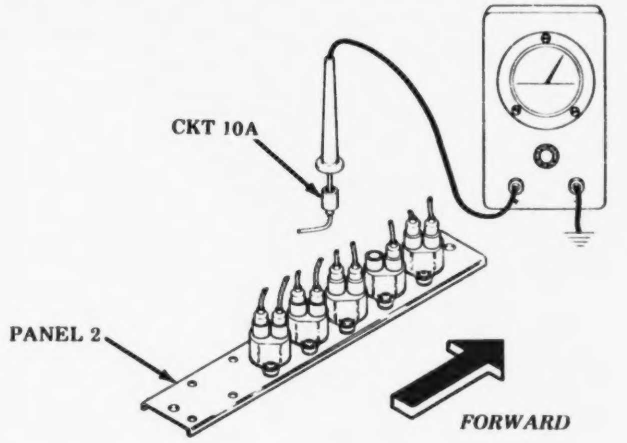
E Reconnect wire harness 12352316 to crew T/A panel. Disconnect wire harness 12352316 from bracket-mounted socket 12351461. Place red probe of multimeter in pin socket A of bracket-mounted socket 12351461 and ground black probe. Check for voltage. Check pin socket B for voltage. If voltage is indicated, replace wire harness 12352316. If no voltage is indicated, go to step F.



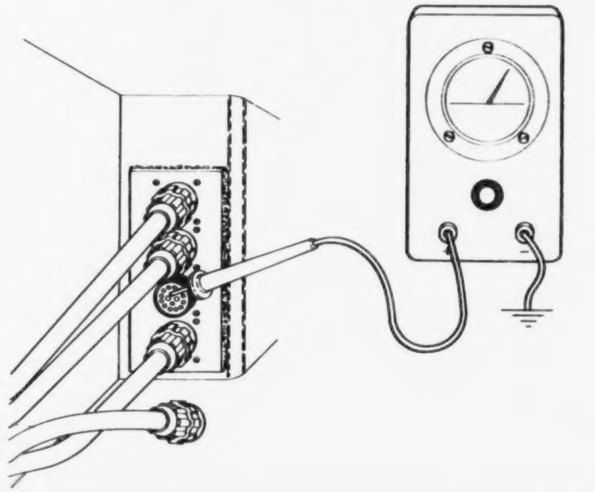
WARNING

Circuit 10A, if functioning properly, is a live circuit carrying a constant 28 volts. Exercise proper precautions when working with this circuit. Failure to do so may result in personal injury or equipment damage.

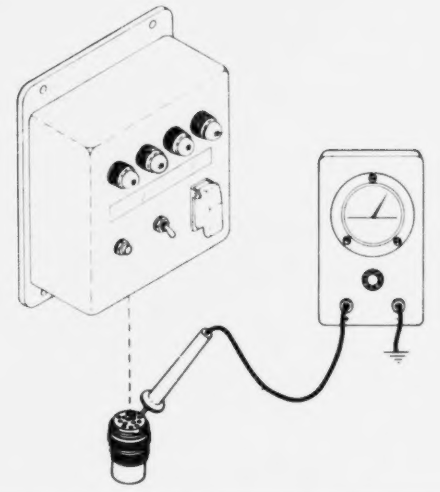
F Reconnect wire harness 12352316 to bracket-mounted socket 12351461. Disconnect wiring harness 12351461, circuit 10A from number 6 positioned circuit breaker, panel no. 2 (located on sponson, directly behind engine T/A panel). Place red probe of multimeter in circuit breaker and ground black probe. Check for voltage. If voltage is indicated, replace wire harness 12351461. If no voltage is indicated, go to step G.



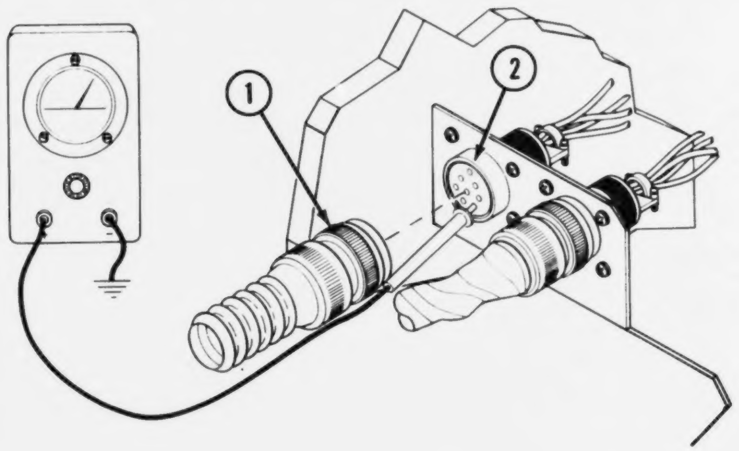
G Reconnect wire harness 12351461, circuit 10A to number 6 positioned circuit breaker, panel no. 2. Disconnect harness 12351754, circuit 10 from number 6 positioned circuit breaker, panel no. 2. Place red probe of multimeter in circuit 10 connector and ground black probe. If voltage is indicated, replace circuit breaker 6 (p 6-54). If no voltage is indicated, go to step H.



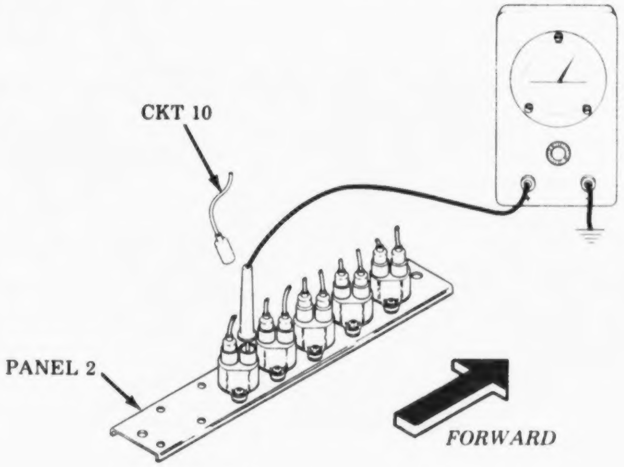
H Reconnect wire harness 12351754, circuit 10 to number 6 positioned circuit breaker, panel no. 2. Disconnect wiring harness 12260287 at bulkhead and place red probe on connector pin socket S of harness 12268100 and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12260287 (p 6-84). If no voltage is indicated, troubleshoot harness 12268100 (p 6-68).



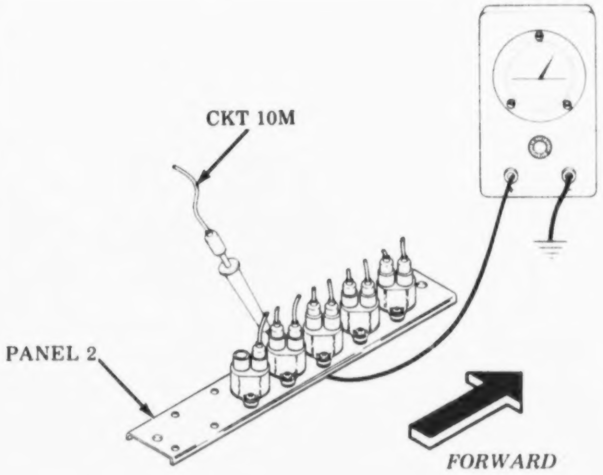
I Disconnect harness wire 12352316 connector from crew T/A panel. Place multimeter red probe on pin A of harness connector and ground black probe. Check for voltage. If voltage is indicated, replace crew T/A panel (p 14-40). If no voltage is indicated, go to step J.



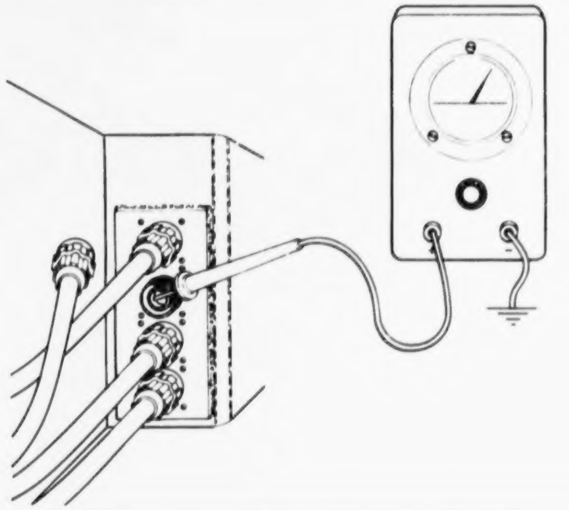
J Reconnect wire harness 12352316 to crew T/A panel. Disconnect harness wire 12352316 connector (1) from bracket-mounted socket (2) of harness 12351461. Place multimeter red probe on pin E of socket and ground black probe. Check for voltage at bracket-mounted socket 12351461. If voltage is indicated, replace wire harness 12352316 (p 14-52.4). If no voltage is indicated, go to step K.



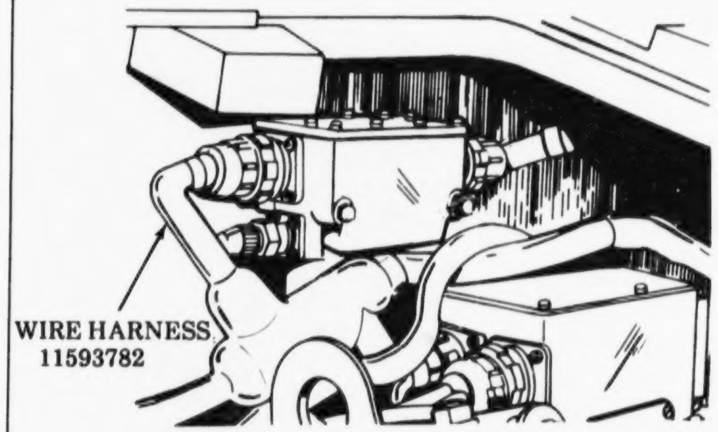
K Reconnect wire harness 12352316 to bracket-mounted socket of harness 12351461. Disconnect wire harness 12351461, circuit 10 from number 3 positioned circuit breaker, panel no. 2. Place red probe of multimeter in circuit breaker socket and ground black probe. Check for voltage. If voltage is indicated, repair or replace harness 12351461, circuit 10 (p 6-93). If no voltage is indicated, go to step L.



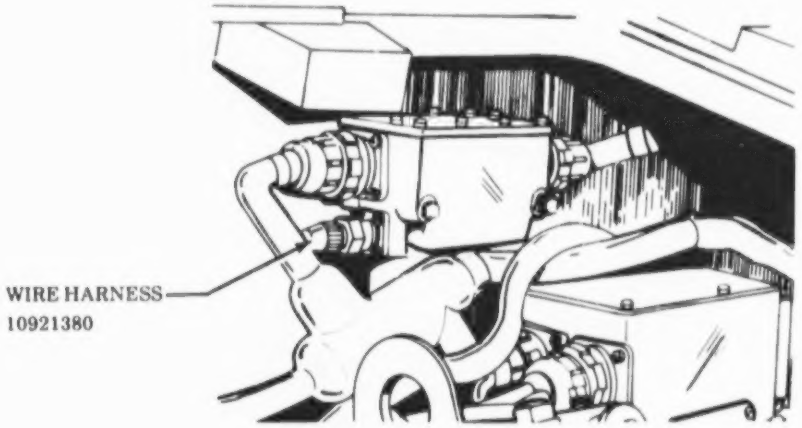
L Reconnect wire harness 12351461, circuit 10 to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 circuit 10M from number 3 positioned circuit breaker. Place red probe of multimeter in circuit 10M and ground black probe. Check for voltage. If voltage is indicated, replace 15 amp circuit breaker. If no voltage is indicated, go to step M.



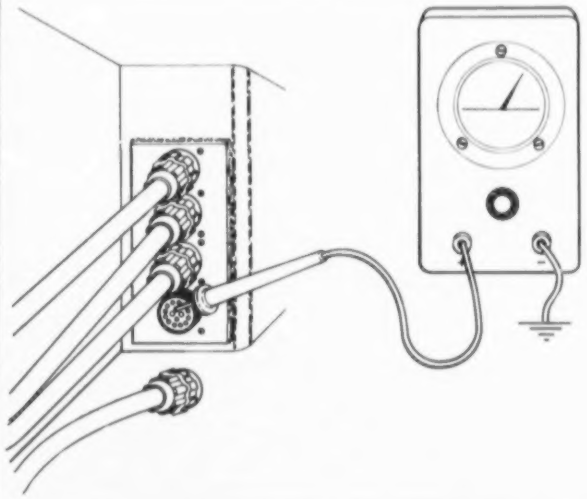
M Reconnect wire harness 12330257, circuit 10 to number 3 positioned circuit breaker, panel no. 2. Disconnect wire harness 12330257 at bulkhead. Place red probe of multimeter in pin socket 49 of wire harness 11593782 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 12330257. If no voltage is indicated, go to step N.



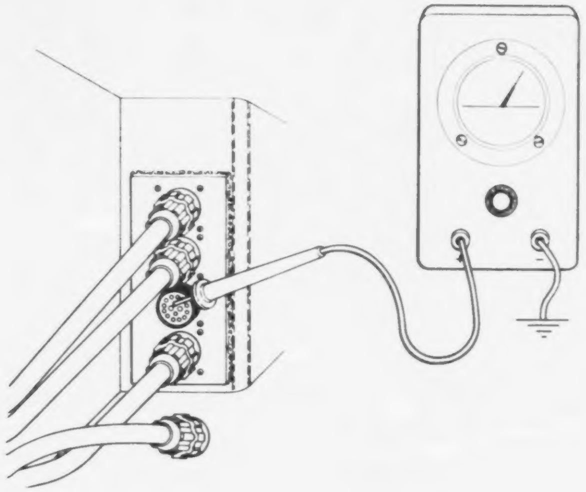
N Reconnect wire harness 12330257 at bulkhead. Disconnect wire harness 11593782 at master relay. Place red probe of multimeter in plug 82 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 11593782. If no voltage is indicated, go to step O.



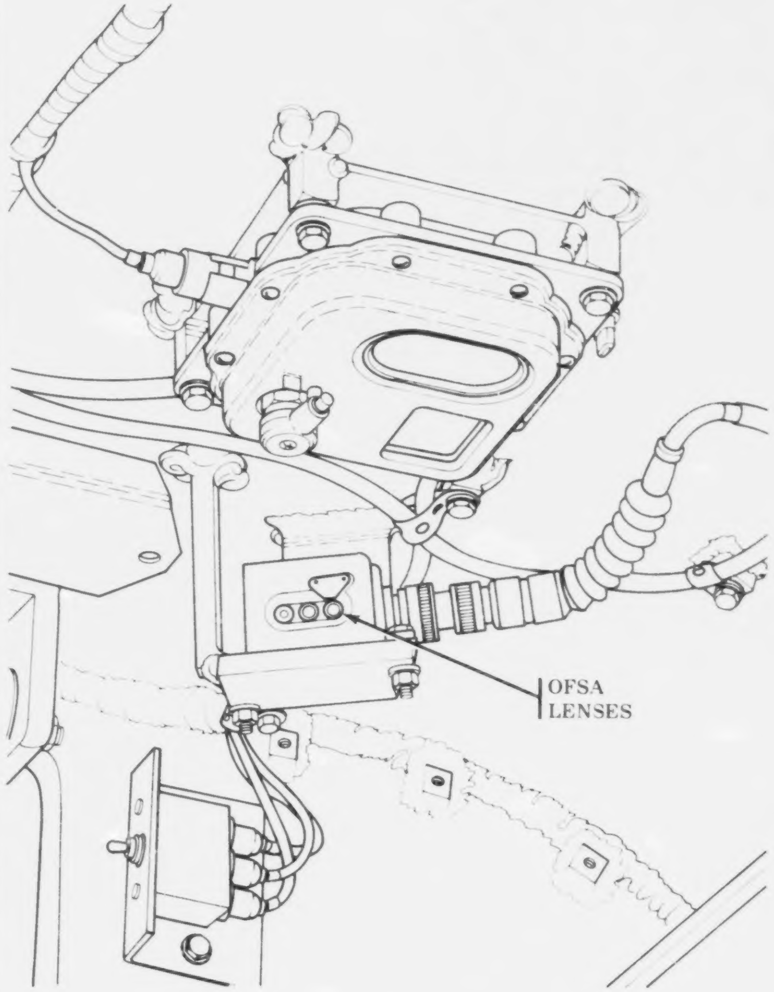
O Reconnect wire harness 11593782 at master relay. Disconnect wire harness 10921380 at master relay. Place red probe of multimeter in connector 459 and ground black probe. Check for voltage. If voltage is indicated, repair or replace master relay. If no voltage is indicated, go to step P.



P Reconnect wire harness 10921380 at master relay. Disconnect wire harness 12330252 at bulkhead. Place red probe of multimeter in pin H of wire harness 10921380 and ground black probe. Check for voltage. If voltage is indicated, repair or replace wire harness 10921380. If no voltage is indicated, go to step Q.

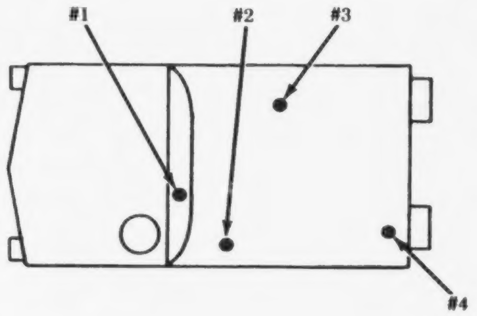


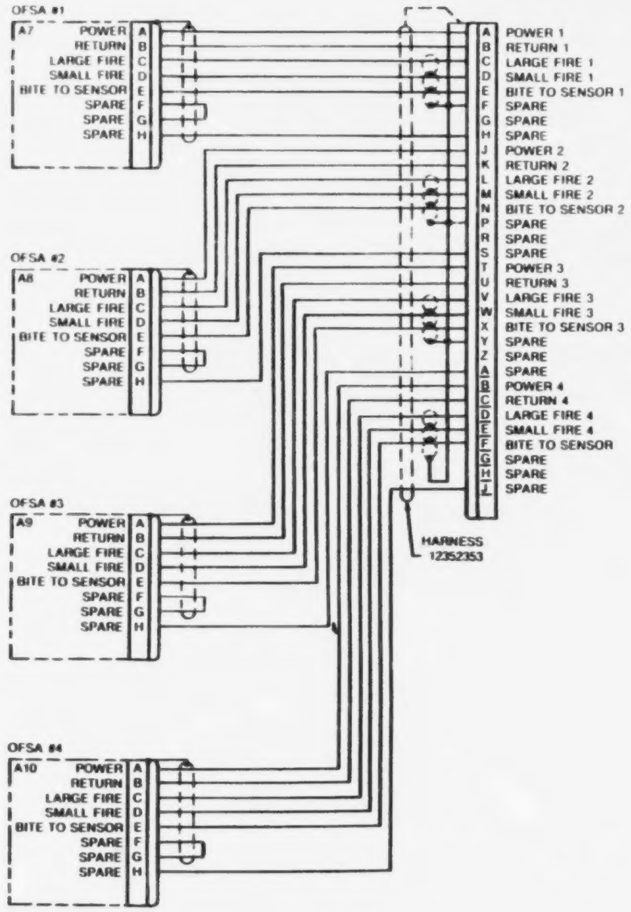
Q Reconnect wire harness 12330252 at bulkhead. Disconnect wire harness 12260287 at bulkhead. Place red probe of multimeter on pin B of wire harness 12268100 and ground black probe. Check for voltage. If no voltage is indicated, check for continuity in wire harness 12268100. If voltage is indicated, go to step W.

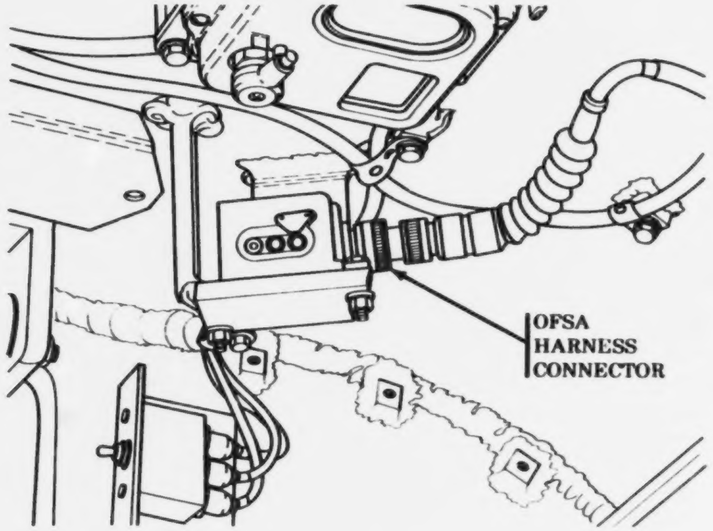


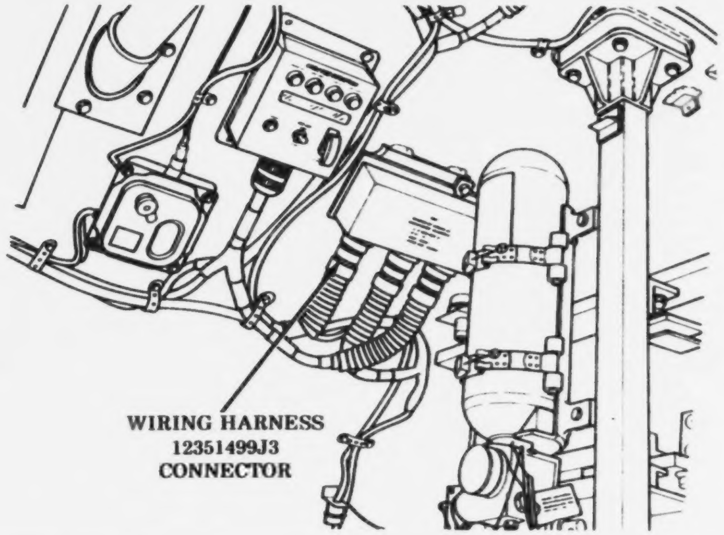
R Using lens paper (item 45, Appx D) clean lenses of all four OFSA's. Run system test by pressing crew T/A panel toggle switch to SYSTEM TEST and releasing. If any one of four FIRE DET LED's is still lit, check that all connector backshells are secure. If any FIRE DET LED's are still lit, turn crew T/A panel MAINTenance switch to vertical position and replace defective OFSA's as indicated by lit LED's. If LED's still light, go to step S

ELECTRICAL SCHEMATIC HARNESS 12352353




OFSA #1
A7
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
OFSA #2
A8
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
OFSA #3
A9
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
OFSA #4
A10
POWER A
RETURN B
LARGE FIRE C
SMALL FIRE D
BITE TO SENSOR E
SPARE F
SPARE G
SPARE H
A POWER 1
B RETURN 1
C LARGE FIRE 1
D SMALL FIRE 1
E BITE TO SENSOR 1
F SPARE
G SPARE
H SPARE
J POWER 2
K RETURN 2
L LARGE FIRE 2
M SMALL FIRE 2
N BITE TO SENSOR 2
P SPARE
R SPARE
S SPARE
T POWER 3
U RETURN 3
V LARGE FIRE 3
W SMALL FIRE 3
X BITE TO SENSOR 3
Y SPARE
Z SPARE
A SPARE
B POWER 4
C RETURN 4
D LARGE FIRE 4
E SMALL FIRE 4
F BITE TO SENSOR
G SPARE
H SPARE
J SPARE
HARNESS 12352353

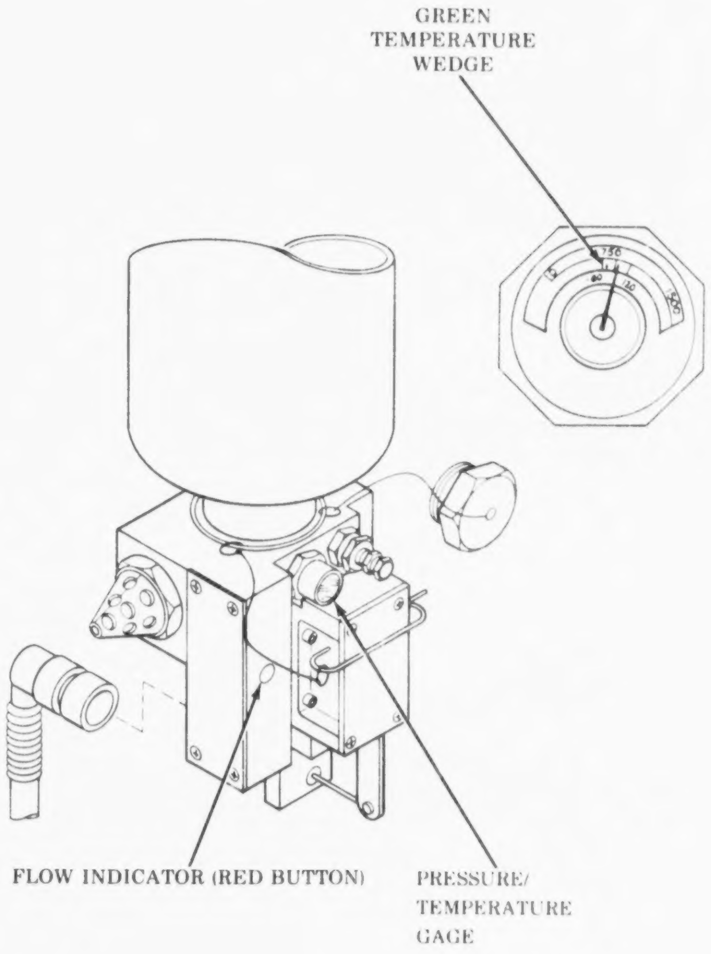




S Disconnect wiring harness 12352353 connector P1 from SCEA J3 and from OFSA's indicated by FIRE DET LED's. Using a multimeter, check continuity of harness circuits using the following as a guide:

FROM SCEA	TO OFSA (S)	REMARKS	
P1-A	P2-A	POWER NO. 1	OFSA NO. 1
P1-B	P2-B	RETURN	
P1-C	P2-C	LARGE FIRE	
P1-D	P2-D	SMALL FIRE	
P1-E	P2-E	BITE	
P1-J	P3-A	POWER NO. 2	OFSA NO. 2
P1-K	P3-B	RETURN	
P1-L	P3-C	LARGE FIRE	
P1-M	P3-D	SMALL FIRE	
P1-N	P3-E	BITE	
P1-T	P4-A	POWER NO. 3	OFSA NO. 3
P1-U	P4-B	RETURN	
P1-V	P4-C	LARGE FIRE	
P1-W	P4-D	SMALL FIRE	
P1-X	P4-E	BITE	
P1-b	P5-A	POWER NO. 4	OFSA NO. 4
P1-c	P5-B	RETURN	
P1-d	P5-C	LARGE FIRE	
P1-e	P5-D	SMALL FIRE	
P1-f	P5-E	BITE	

If continuity is not indicated, replace harness (p 14-52.6).

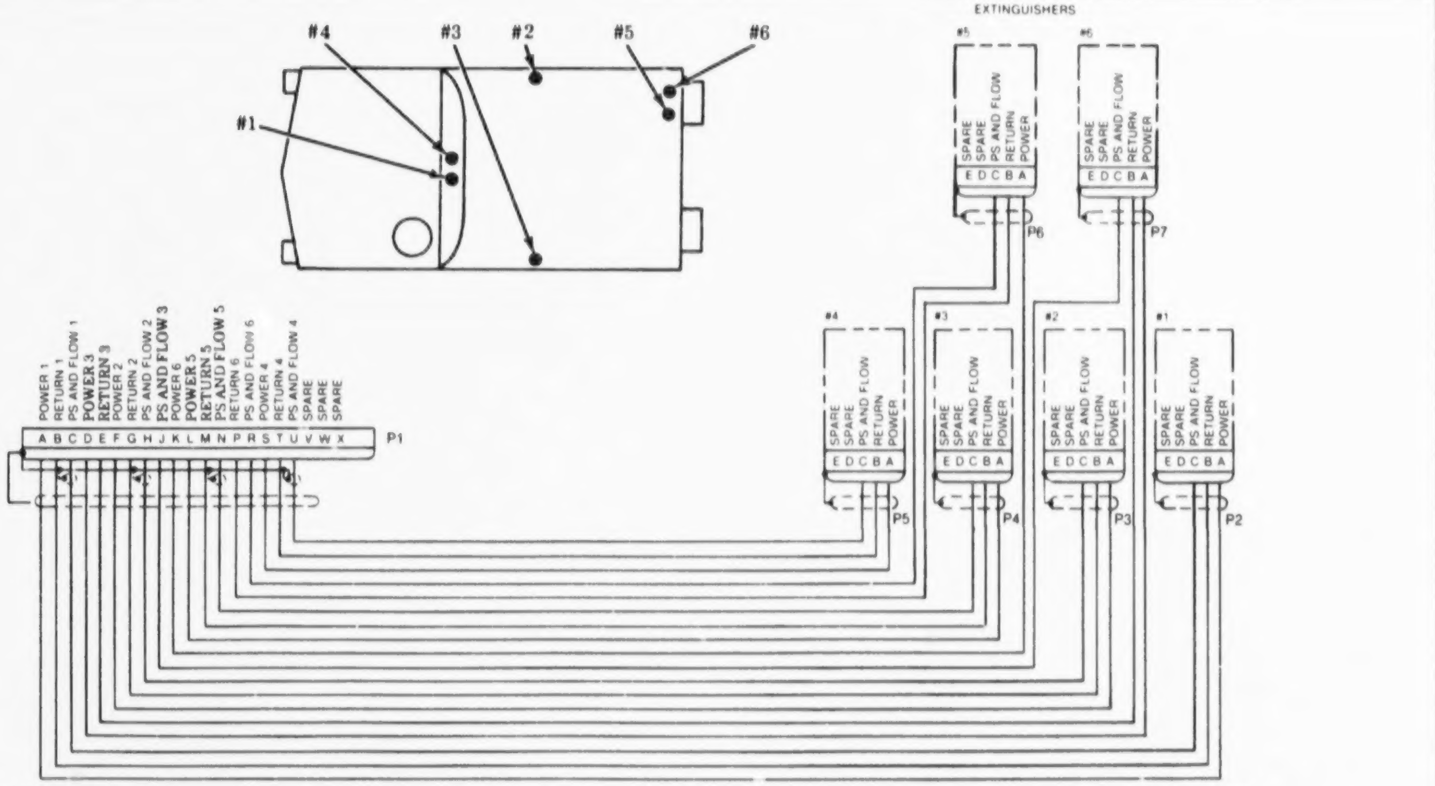

GREEN TEMPERATURE WEDGE
750
60
120
1500
FLOW INDICATOR (RED BUTTON)
PRESSURE/ TEMPERATURE GAGE

NOTE

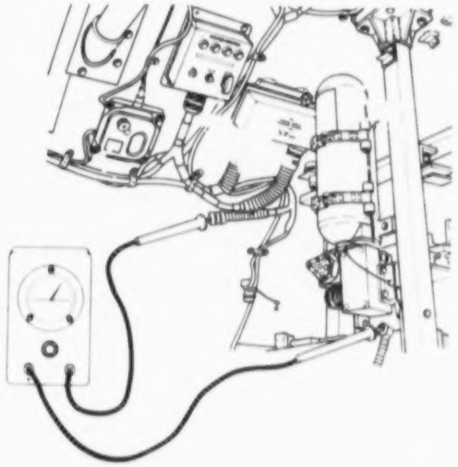
If FIRE EXT LED's are lit for crew extinguishers no. 3, no. 4, no. 5 and/or no. 6, removal of projectile racks is not required.

T Remove both right and left projectile racks (TM 9-2350-267-10). Check for protruding flow indicator of valve actuators of crew extinguishers no. 1 thru no.6 as indicated by lit LED's. Check pressure gage of crew extinguishers. Black pointer of pressure gage must be on green temperature wedge. If pressure is correct, but flow indicator is protruding, reset flow indicator by pushing into valve body. Verify LED is no longer lit. If pressure is low, replace crew extinguisher as indicated by lit LED's. If flow indicator is not protruding from valve, and pressure gage is correct, go to step U.

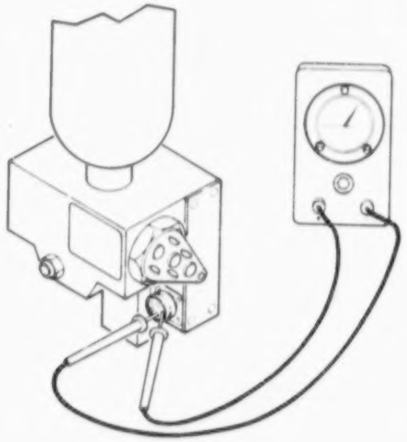
ELECTRICAL
SCHEMATIC
HARNESS
12352315


#4
#3
#2
#5
#6
#1
EXTINGUISHERS
#5
#6
SPARE
SPARE
PS AND FLOW
RETURN
POWER
E D C B A
P6
P7
#4
#3
#2
#1
P5
P4
P3
P2
POWER 1
RETURN 1
PS AND FLOW 1
POWER 3
RETURN 3
POWER 2
RETURN 2
PS AND FLOW 2
PS AND FLOW 3
POWER 6
POWER 5
RETURN 5
PS AND FLOW 5
RETURN 6
PS AND FLOW 6
POWER 4
RETURN 4
PS AND FLOW 4
SPARE
SPARE
SPARE
A B C D E F G H J K L M N P R S T U V W X
P1

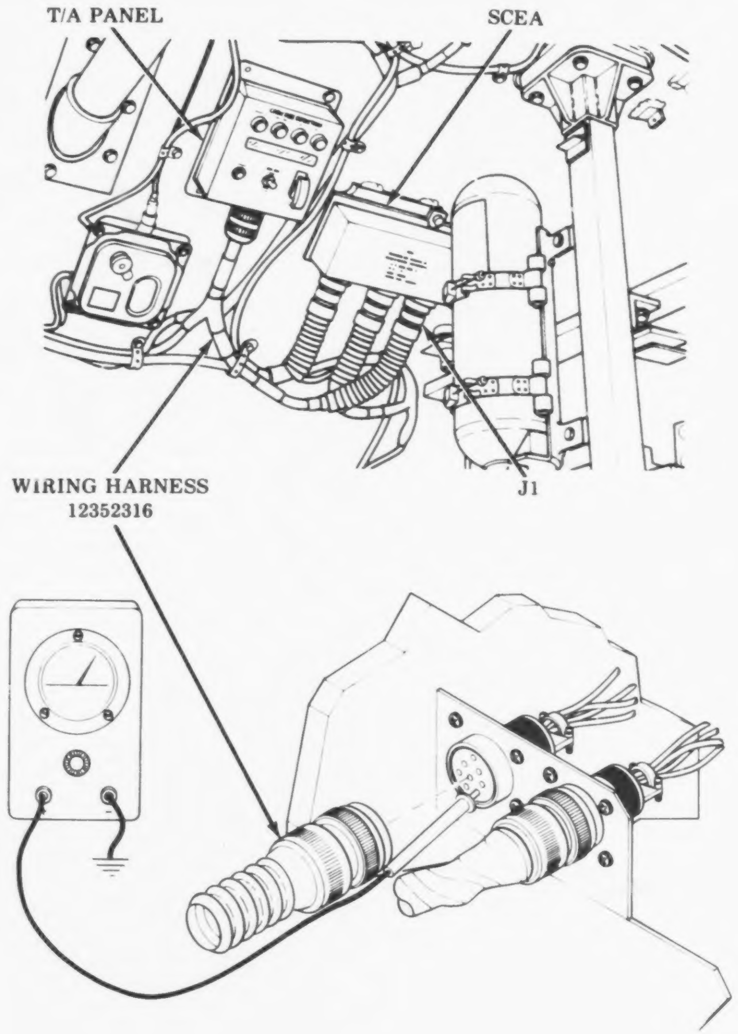
SCEA	EXTINGUISHER	REMARKS
P1-A	P2-A	POWER NO. 1
P1-B	P2-B	RETURN EXTINGUISHER NO. 1
P1-C	P2-C	P/S AND FLOW NO. 1
P1-F	P3-A	POWER NO. 2
P1-G	P3-B	RETURN EXTINGUISHER NO. 2
P1-H	P3-C	P/S AND FLOW NO. 2
P1-D	P4-A	POWER NO. 3
P1-E	P4-B	RETURN EXTINGUISHER NO. 3
P1-J	P4-C	P/S AND FLOW NO. 3
P1-S	P5-A	POWER NO. 4
P1-T	P5-B	RETURN EXTINGUISHER NO. 4
P1-U	P5-C	P/S AND FLOW NO. 4
P1-L	P6-A	POWER NO. 5
P1-M	P6-B	RETURN EXTINGUISHER NO. 5
P1-N	P6-C	P/S AND FLOW NO. 5
P1-K	P7-A	POWER NO. 6
P1-P	P7-B	RETURN EXTINGUISHER NO. 6
P1-R	P7-C	P/S AND FLOW NO. 6



U Disconnect wire harness 12352315 from SCEA J2 and disconnect harness 12352315 from actuator of defective extinguisher, as indicated by lit LED's. Using a multimeter, check harness 12352315 circuits for continuity between SCEA plug and defective extinguisher plug. If no continuity in any one or all circuits, replace harness 12352315 (p 14-52). If continuity is indicated, go to step V.

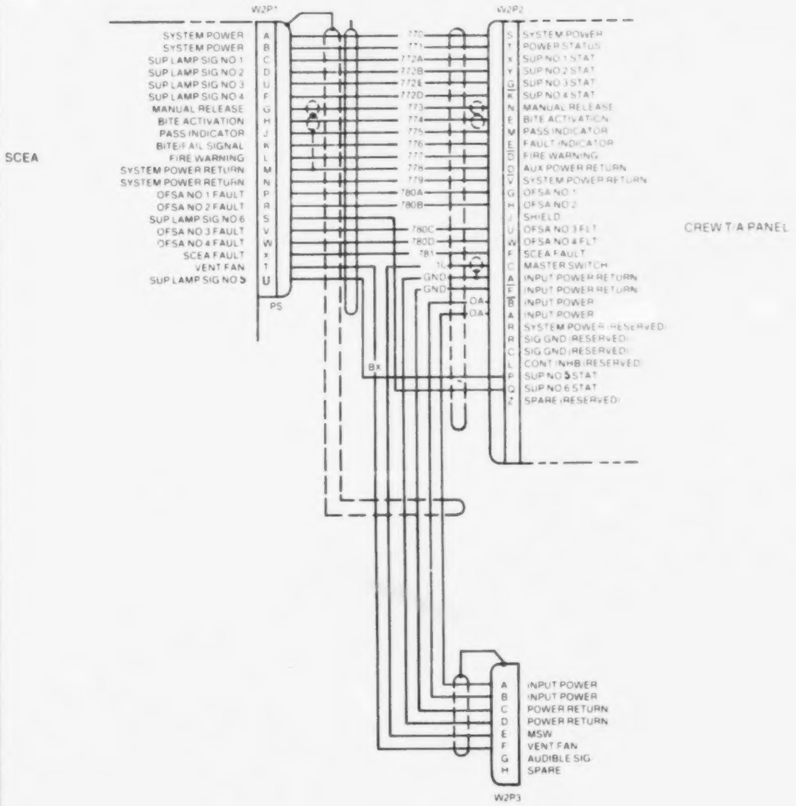


V Using a multimeter, check continuity between A-B and B-C of crew extinguisher(s) actuator at socket as indicated by lit LED's. If no continuity is indicated, replace appropriate extinguisher (p 14-28.9). If continuity is indicated, replace SCEA (p 14-40).



W Disconnect wiring harness 12352316 for SCEA J1, crew T/A panel, and connector W2P3. Using a multimeter, check continuity of harness circuits using the following as a guide:

FROM SCEA	TO CREW T/A PANEL	REMARKS
P1-A	P2-S	SYSTEM POWER
P1-B	P2-T	SYSTEM POWER
P1-C	P2-X	SUP NO. 1 STATUS
P1-D	P2-Y	SUP NO. 2 STATUS
P1-U	P2-g	SUP NO. 5 STATUS
P1-F	P2-K	SUP NO. 4 STATUS
P1-G	P2-N	MANUAL RELEASE
P1-H	P2-E	BITE ACTIVATION
P1-J	P2-M	PASS INDICATOR
P1-K	P2-e	FAULT INDICATOR
P1-L	P2-D	FIRE WARNING
P1-M	P2-d	SYSTEM POWER RETURN
P1-N	P2-V	SYSTEM POWER RETURN
P1-P	P2-G	OFSA NO. 1 FAULT
P1-E	P2-P	SUP NO. 5 STATUS
P1-S	P2-Q	SUP NO. 6 STATUS


SCEA
W2P1
SYSTEM POWER A
SYSTEM POWER B
SUP LAMP SIG NO 1 C
SUP LAMP SIG NO 2 D
SUP LAMP SIG NO 3 U
SUP LAMP SIG NO 4 F
MANUAL RELEASE G
BITE ACTIVATION H
PASS INDICATOR J
BITE/FAIL SIGNAL K
FIRE WARNING L
SYSTEM POWER RETURN M
SYSTEM POWER RETURN N
OFSA NO 1 FAULT P
OFSA NO 2 FAULT R
SUP LAMP SIG NO 6 S
OFSA NO 3 FAULT V
OFSA NO 4 FAULT W
SCEA FAULT X
VENT FAN T
SUP LAMP SIG NO 5 U
PS
770
771
772A
772B
772E
772D
773
774
775
776
777
778
779
780A
780B
780C
780D
781
10
GND
GND
OA
OA
BX
W2P2
S SYSTEM POWER
T POWER STATUS
X SUP NO 1 STAT
Y SUP NO 2 STAT
G SUP NO 3 STAT
K SUP NO 4 STAT
N MANUAL RELEASE
E BITE ACTIVATION
M PASS INDICATOR
E FAULT INDICATOR
D FIRE WARNING
D AUX POWER RETURN
V SYSTEM POWER RETURN
G OFSA NO 1
H OFSA NO 2
J SHIELD
U OFSA NO 3 FLT
W OFSA NO 4 FLT
F SCEA FAULT
C MASTER SWITCH
A INPUT POWER RETURN
F INPUT POWER RETURN
B INPUT POWER
A INPUT POWER
R SYSTEM POWER (RESERVED)
R SIG GND (RESERVED)
C SIG GND (RESERVED)
L CONT INHB (RESERVED)
P SUP NO 5 STAT
Q SUP NO 6 STAT
Z SPARE (RESERVED)
CREW T/A PANEL
A INPUT POWER
B INPUT POWER
C POWER RETURN
D POWER RETURN
E MSW
F VENT FAN
G AUDIBLE SIG
H SPARE
W2P3

ELECTRICAL SCHEMATIC
HARNESS 12352316

FROM SCEA	TO CREW T/A PANEL	REMARKS
P1-R	P2-H	OFSA NO. 2 FAULT
P1-V	P2-U	OFSA NO. 3 FAULT
P1-W	P2-W	OFSA NO. 4 FAULT
P1-X	P2-F	SCEA FAULT

FROM SCEA	TO W2P3	REMARKS
P1-T	P3-F	VENT FAN

FROM T/A PANEL	TO W2P3	REMARKS
P2-C	P3-E	MASTER SWITCH
P2-A	P3-D	INPUT POWER RETURN
P2-F	P3-C	INPUT POWER RETURN
P2-B	P3-B	INPUT POWER
P2-A	P3-A	INPUT POWER

If continuity is not indicated at all test points, replace harness 12352316 (p 14-52.4). If continuity is indicated at all test points, replace SCEA.

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM **FIRE DETECTION** **TEST AND ALARM PANEL INDICATORS**	**POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED OFF**

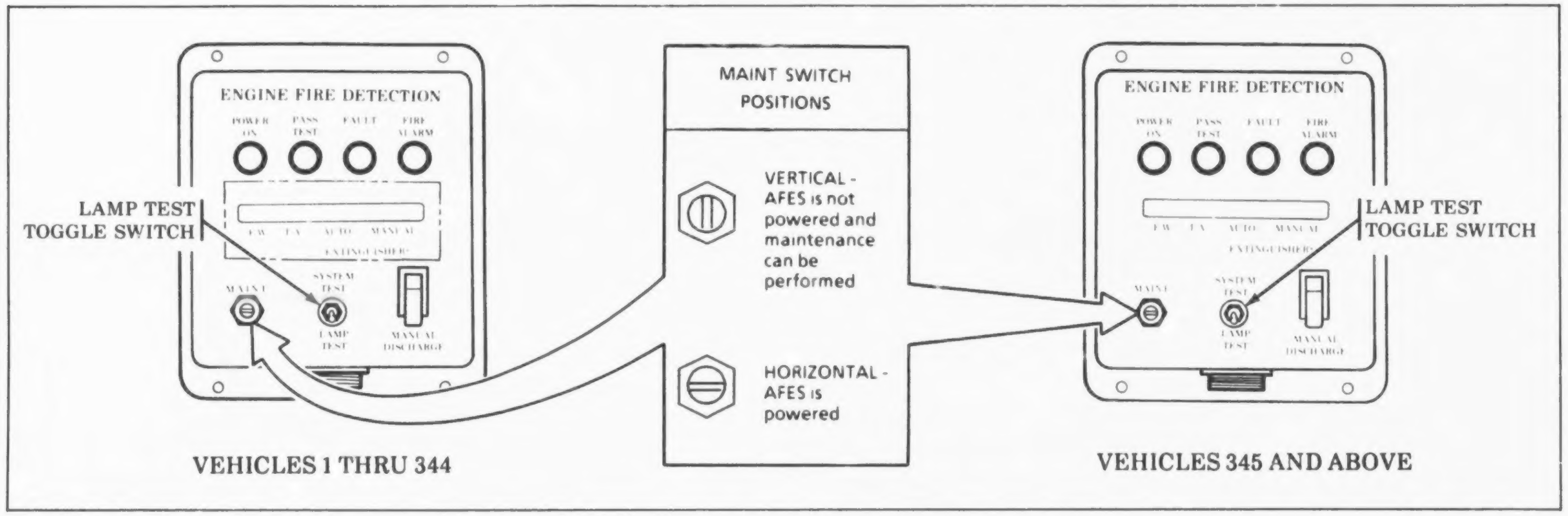
START HERE

1. Turn engine T/A panel MAINTenance switch to horizontal position.

2. Press LAMP TEST toggle switch on engine T/A panel to check for defective bulb. Replace defective bulbs.

3. If lamps on engine T/A panel do not operate when MASTER switch is OFF, check battery charge. If charge is low, service in accordance with TM 9-6140-200-14 or replace batteries (p 6-44).

4. If batteries are good, troubleshoot AFES power. Vehicles 1 thru 344, steps C thru Q (p 2-281). Vehicles 345 and above, steps C thru Q (p 2-306.1).


ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
LAMP TEST TOGGLE SWITCH
F.W
F.A
AUTO
MANUAL
EXTINGUISHER
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE
MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
LAMP TEST TOGGLE SWITCH

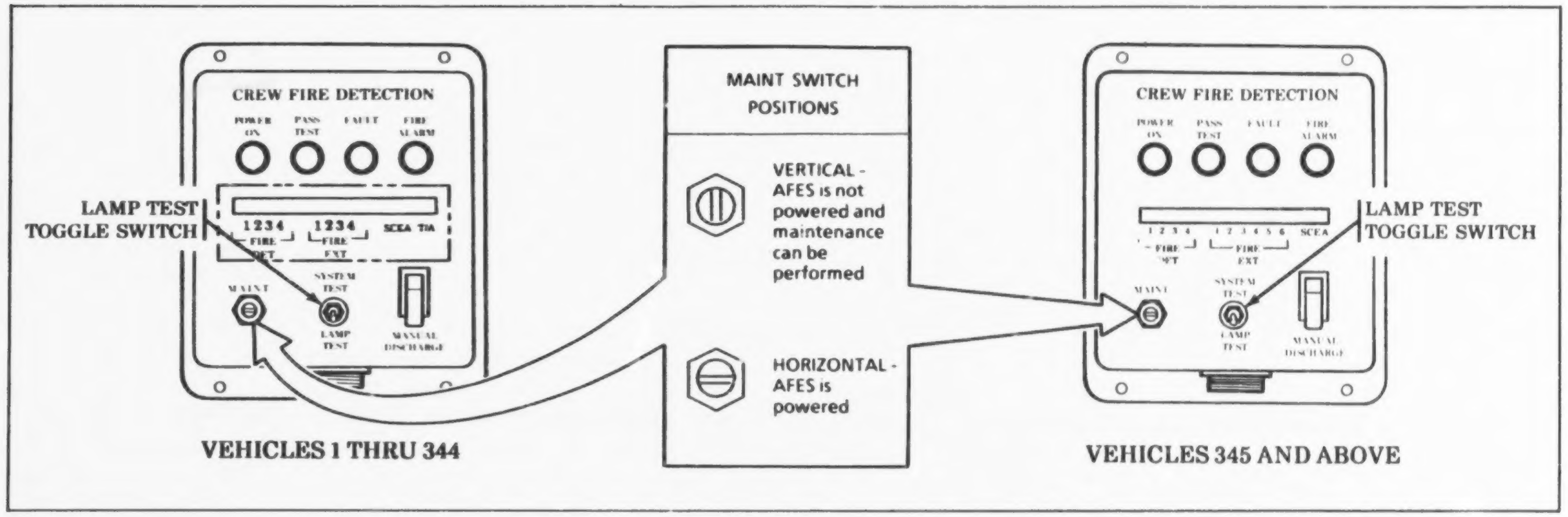
VEHICLES 1 THRU 344

VEHICLES 345 AND ABOVE

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM FIRE DETECTION TEST AND ALARM PANEL INDICATORS	**POWER ON LAMP DOES NOT LIGHT WHEN MASTER SWITCH IS TURNED OFF**

START HERE

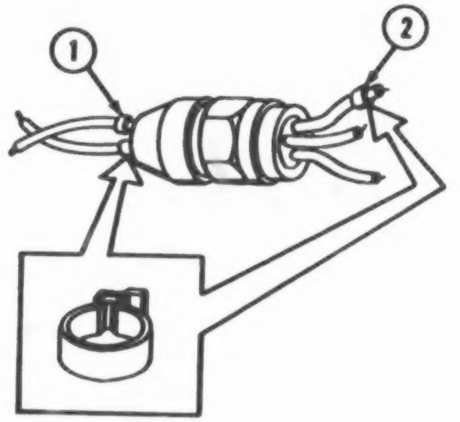
1. Turn crew T/A panel MAINTenance switch to horizontal position.
2. Press LAMP TEST toggle switch on crew T/A panel to check for defective bulbs. Replace defective bulbs.
3. If lamps on crew T/A panel do not operate when MASTER switch is OFF, check battery charge. If charge is low, service in accordance with TM 9-6140-200-14 or replace batteries (p 6-44).
4. If batteries are good, troubleshoot AFES power. Vehicles 1 thru 344, steps C thru Q (p 2-296.1). Vehicles 345 and above, steps C thru Q (p 2-306.20).

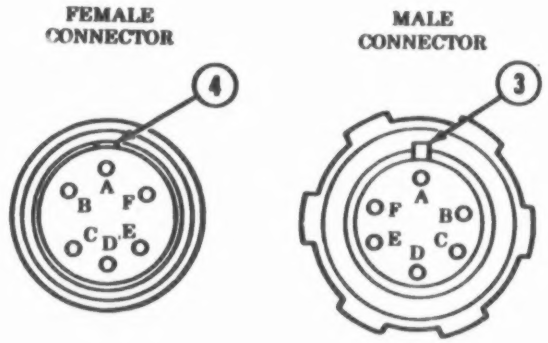

CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
LAMP TEST TOGGLE SWITCH
1 2 3 4 FIRE DET
1 2 3 4 FIRE EXT
SCEA T/A
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE
MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
LAMP TEST TOGGLE SWITCH
1 2 3 4 FIRE DET
1 2 3 4 5 6 FIRE EXT
SCEA
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

VEHICLES 1 THRU 344

VEHICLES 345 AND ABOVE

Section VI WIRING HARNESS AND CABLE REPAIRS





CAUTION

Use resin core solder only.

CABLE WIRE, RECEPTACLE AND PLUG, IDENTIFIERS

A Cable identifiers (1) are aluminum tags attached to cables. These tags are embossed with the cable identification number. The identification number is the same number as shown on the system wiring diagram.

B Wire identifiers (2) are embossed with the individual wire number. The wire number is the same as shown on the systems wiring diagram.

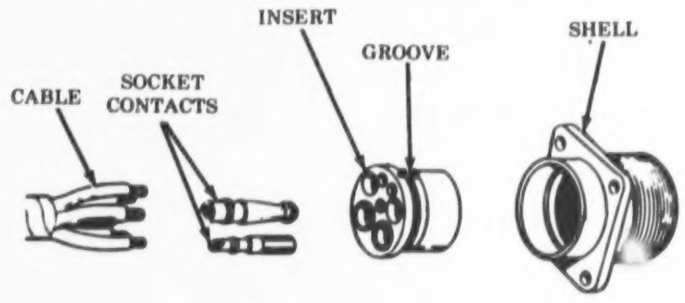
NOTE

If cables or wires are replaced, remove tags from old wire and place on new wires.

C Receptacles and plugs. All pins (male connectors) and sockets (female connectors) in receptacles and plugs are identified by alphabetic code. Coded identification starts at the connector key (3) or groove (4). Identifying letters on male connectors run clockwise. Identifying letters on female connectors run counterclockwise.

TA312713

WIRING HARNESS AND CABLE REPAIRS: DISASSEMBLY AND ASSEMBLY (CONTINUED)



TYPICAL FEMALE-TYPE PANEL MOUNTING RECEPTACLE

DISASSEMBLY

A Drive socket contact out through rear of insert with pin extractor.

B Unsolder cable leads from solder wells on socket contacts.

C Slide insert out through rear of shell.

ASSEMBLY

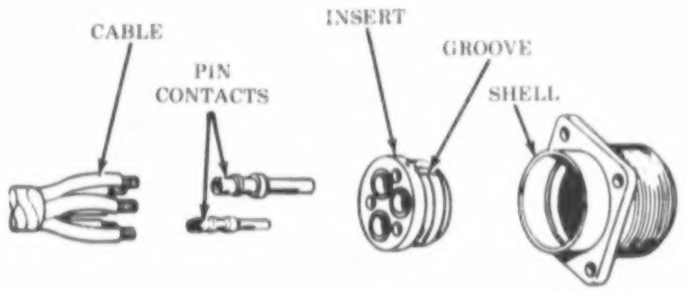
A Strip cable insulation equal to depth of solder wells of socket contacts.

B Insert cable leads into solder wells of socket contacts and solder using resin core solder only.

C Push insert into shell from rear until seated. Groove in insert must be alined with guide in shell to ensure proper fit.

D Push socket contacts into insert from rear until seated.

TA310667



TYPICAL MALE-TYPE PANEL MOUNTING RECEPTACLE

DISASSEMBLY

A Drive pin contacts out through rear of insert with pin extractor.

B Unsolder cable leads from solder wells on pin contacts.

C Slide insert out through rear of shell.

ASSEMBLY

A Strip cable insulation equal to depth of solder wells of pin contacts.

B Insert cable leads into solder wells of pin contacts and solder using resin core solder only.

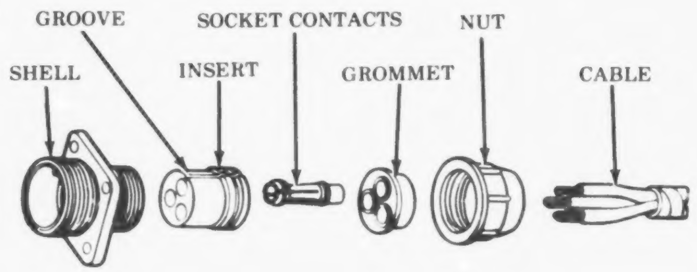
C Push insert into shell from rear until seated. Groove in insert must be alined with guide in shell to ensure proper fit.

D Push pin contacts into insert from rear until seated.

TA310668

WIRING HARNESS AND CABLE REPAIRS: DISASSEMBLY AND ASSEMBLY (CONTINUED)

TYPICAL FEMALE-TYPE PANEL MOUNTING RECEPTACLE WITH RIDGED LOCKING NUT



DISASSEMBLY

A Unscrew nut from shell assembly and slide back on cable.

B Slide grommet back on cable leads.

C Drive socket contacts out through front of insert with pin extractor.

D Unsolder leads from socket contacts.

E Push insert out through rear of shell.

ASSEMBLY

A Strip cable insulation to depth of solder wells of socket contacts.

B Slide nut over cable.

C Slide grommet over cable leads.

D Insert cable leads into solder wells of socket contacts and solder using resin core solder only.

E Push insert into shell from rear until seated. Groove in insert must be alined with guide in shell to ensure proper fit.

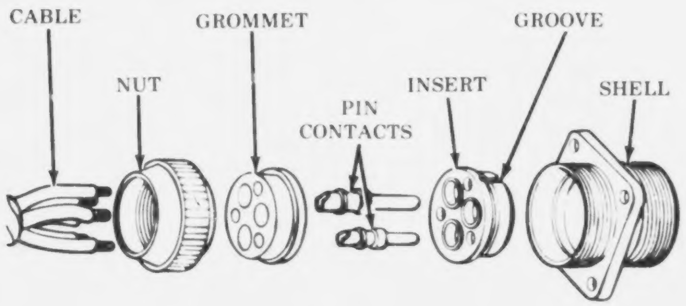
F Push socket contacts into insert from rear until seated.

G Push grommet down cable leads and over solder wells of socket contacts.

H Screw nut onto shell assembly.

TA310669

TYPICAL MALE-TYPE PANEL MOUNTING RECEPTACLE WITH RIDGED LOCKING NUT



DISASSEMBLY

A Unscrew nut from shell assembly and slide back on cable.

B Push grommet back on cable leads.

C Drive pin contacts out through rear of insert with pin extractor.

D Push insert out through rear of shell.

E Unsolder leads from pin contacts.

ASSEMBLY

A Strip cable insulation equal to depth of solder wells of pin contacts.

B Slide nut onto cable.

C Slide grommet over cable leads.

D Insert cable leads into solder wells of pin contacts and solder, using resin core solder only.

E Push insert into shell from rear until seated. Groove in insert must be alined with guide in shell to ensure proper fit.

F Push pin contacts into insert from rear until seated.

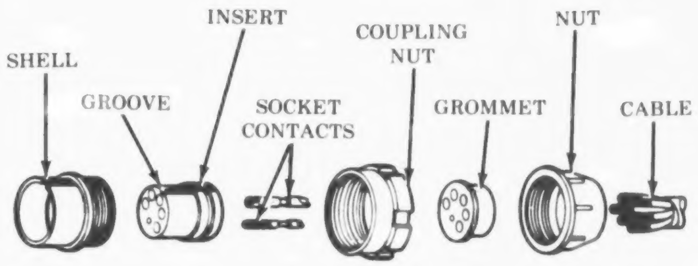
G Push grommet down cable leads and over solder wells of pin contacts.

H Screw nut onto shell assembly.

TA310670

WIRING HARNESS AND CABLE REPAIRS: DISASSEMBLY AND ASSEMBLY (CONTINUED)

TYPICAL FEMALE-TYPE PLUG WITH RIDGED LOCKING NUT



DISASSEMBLY

A Unscrew nut from shell assembly and slide back on cable.

B Slide grommet back on cable leads.

C Slide coupling nut off shell.

D Drive socket contacts out through rear of insert with pin extractor.

E Push insert out through rear of shell.

F Unsolder leads from socket contact.

ASSEMBLY

A Strip cable insulation equal to depth of solder wells of socket contacts.

B Slide nut over cable leads.

C Slide grommet over cable leads.

D Insert cable leads into solder wells of socket contacts and solder using resin core solder only.

E Push insert into shell from rear until seated. Groove in insert must be alined with guide in shell to ensure proper fit.

F Push socket contacts into insert rear until seated.

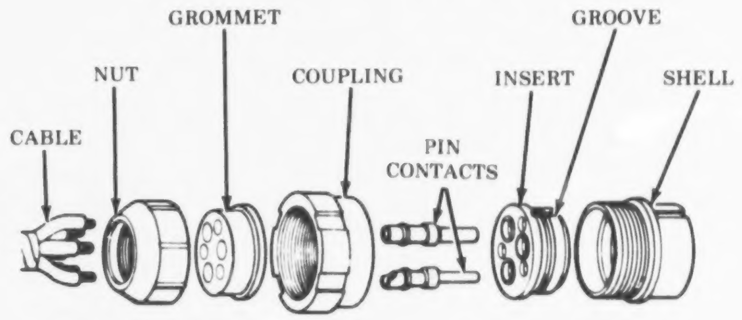
G Slide coupling nut onto shell assembly.

H Push grommet down cable leads and over solder wells of socket contacts.

I Screw nut onto shell assembly.

TA310671

TYPICAL MALE-TYPE PLUG WITH RIDGED LOCKING NUT



DISASSEMBLY

A Unscrew nut from shell assembly and slide back on cable.

B Slide grommet back on cable leads.

C Slide coupling nut off shell assembly.

D Drive pin contacts out through rear of insert with pin extractors.

E Push insert out through rear of shell.

F Unsolder cable leads from pin contacts.

ASSEMBLY

A Strip cable of insulation equal to depth of solder wells of pin contact.

B Slide nut over cable.

C Slide grommet over cable leads.

D Insert cable leads into solder wells of pin contacts and solder using resin core solder only.

E Push insert into shell from rear until seated. Groove in insert must be alined with guide in shell to ensure proper fit.

F Push pin contacts into insert from rear until seated.

G Slide coupling nut onto shell assembly.

H Push grommet down cable leads and over solder wells of pin contacts.

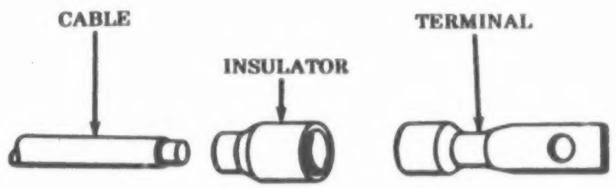
I Screw nut onto shell assembly.

TA310672

WIRING HARNESS AND CABLE REPAIRS: DISASSEMBLY AND ASSEMBLY (CONTINUED)

CABLE TERMINALS AND CONNECTORS:

REPLACEMENT TERMINAL-TYPE CABLE CONNECTORS


CABLE
INSULATOR
TERMINAL

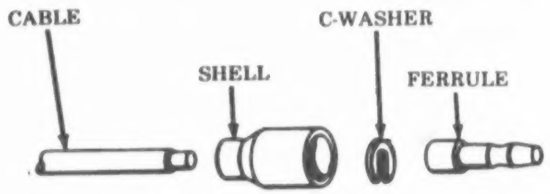
A Strip cable insulation equal to depth of terminal well.

B Slide insulator over cable.

C Insert cable into terminal well and crimp.

D Slide insulator over crimped end of terminal.

MALE CABLE CONNECTOR (WITH WASHER)


CABLE
C-WASHER
SHELL
FERRULE

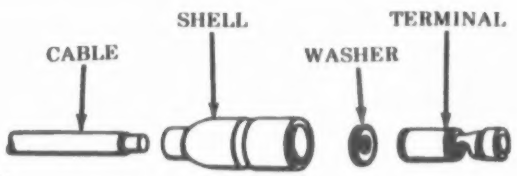
A Strip cable insulation equal to depth of ferrule well.

B Slide shell over cable.

C Insert cable into terminal well and crimp.

D Place C-washer over cable at crimped junction and slide shell over C-washer and terminal.

FEMALE CABLE CONNECTOR (WITH WASHER)


SHELL
TERMINAL
CABLE
WASHER

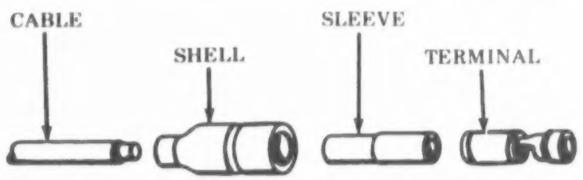
A Strip cable insulation approximately 1/8-inch.

B Slide shell and washer over cable.

C Place cable in cylinder end of terminal and crimp.

D Slide shell and washer over terminal.

FEMALE CABLE CONNECTOR (WITH SLEEVE)


CABLE
SLEEVE
SHELL
TERMINAL

A Strip cable insulation approximately 1/8-inch.

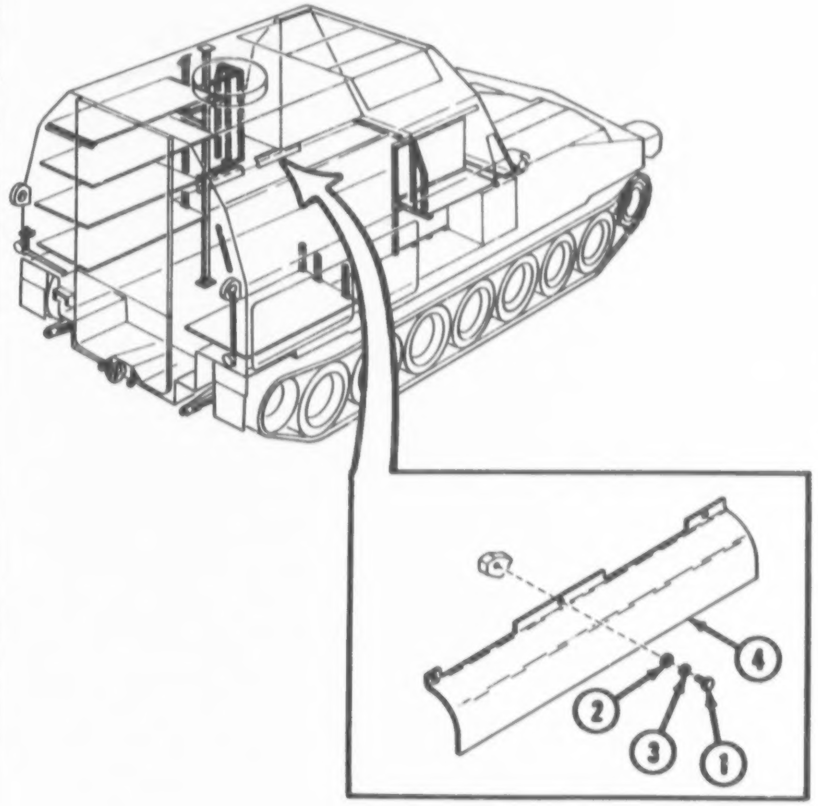
B Slide shell and sleeve over cable.

C Place cable in cylinder end of terminal and crimp.

D Slide shell and sleeve over terminal.

TA310673

WIRING HARNESS GUARD: REMOVAL AND INSTALLATION



REMOVAL

Remove four screws (1), four flat washers (2), four lockwashers (3) and guard (4). Discard lockwashers.

INSTALLATION

Install four new lockwashers (3), four flat washers (2), four screws (1) and guard (4).

TA312714

CHAPTER 3
MAINTENANCE PROCEDURES
POWERPACK REMOVAL, INSTALLATION AND TEST

CHAPTER OVERVIEW

This chapter shows and describes removal and installation of the complete powerpack, consisting of the engine, transfer case, transmission assemblies and related accessories.

Procedures for operating the powerpack, after removal from the vehicle, are given.

The powerpack shall be given periodic checks to find possible fire hazards. Inspect powerpack cooling accessories, air shrouds, wiring and powerpack hull compartment for foreign matter during each maintenance service.

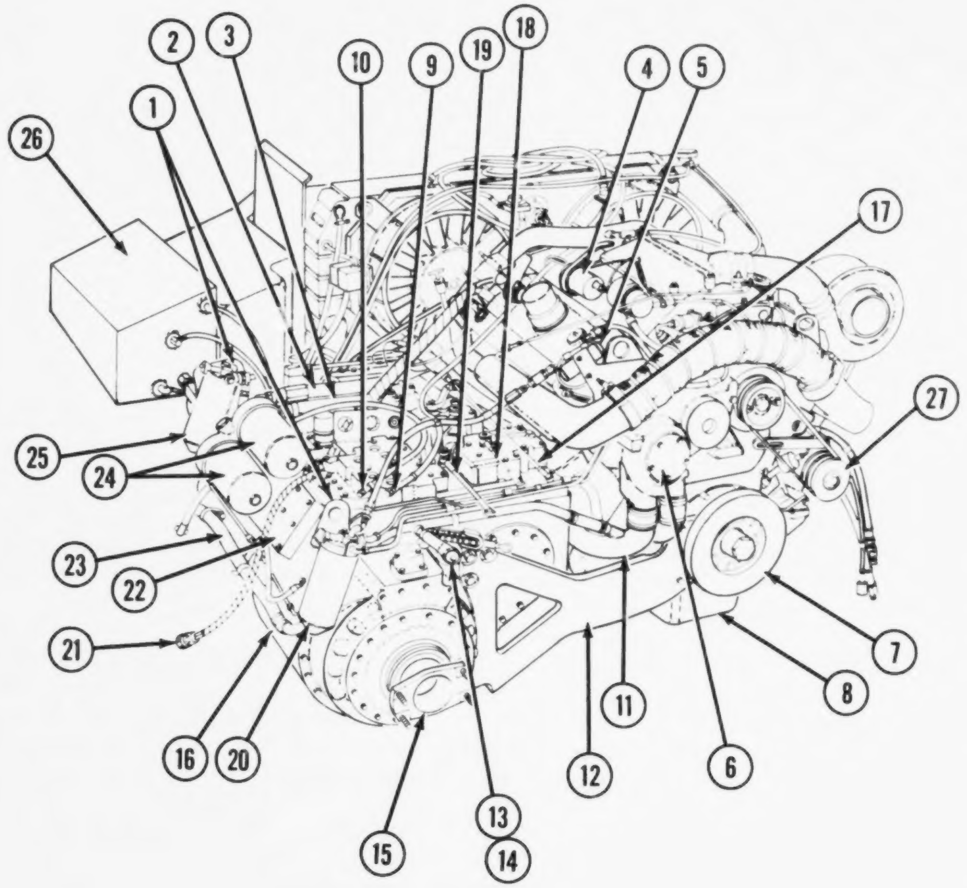
Whenever a powerpack is removed for maintenance, or because of a malfunction, general cleaning and inspection of wiring, hoses, piping and engine compartment should be a standard practice.

Maintenance procedures given in this chapter are:

- Powerpack Preliminary Removal Procedures (p 3-4 through 3-23).
- Powerpack Removal and Installation (p 3-24).
- Control and Drive Components Inspection (p 3-25).
- Special Equipment Hookups for Operation out of Vehicle (p 3-25).
- Powerpack Stall Test with Powerpack Removed (p 3-29).

TA310247

POWERPACK — LEFT FRONT VIEW

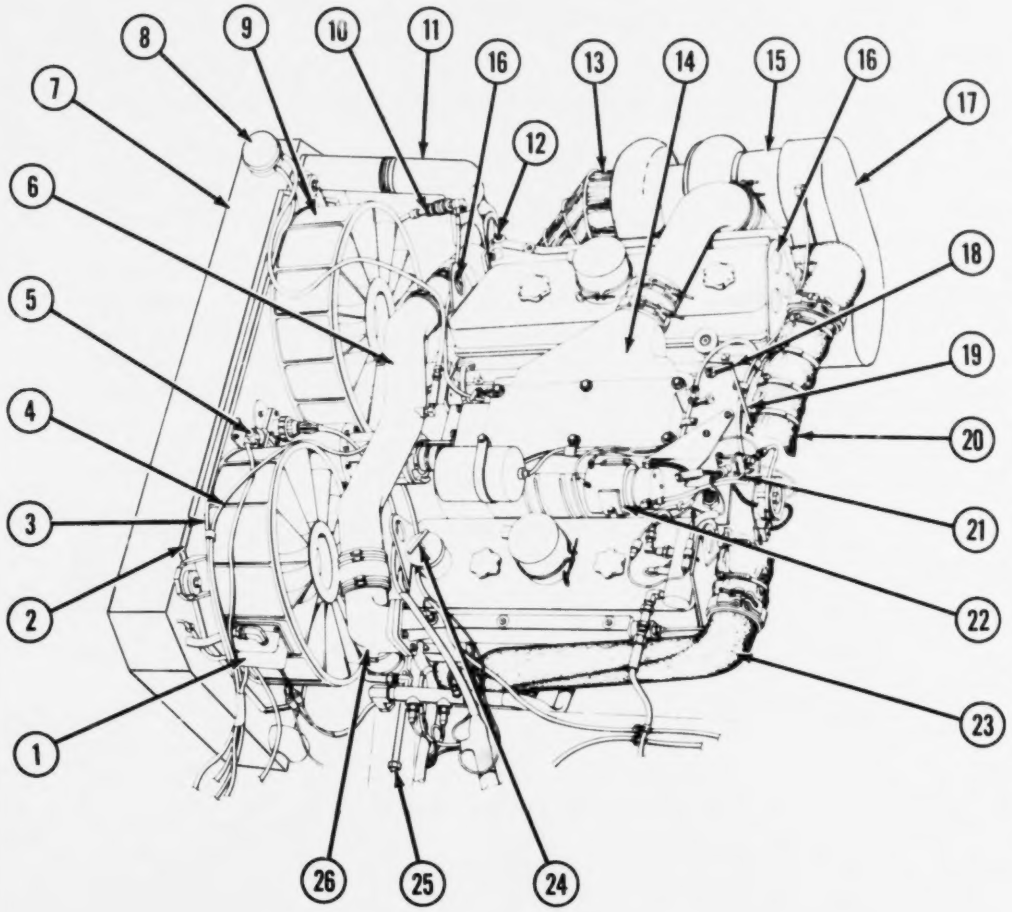


LEGEND

1	Lifting eye, transmission
2	Engine oil filter to oil cooler hose
3	Engine oil cooler to filter hose
4	Flame heater igniter
5	Electric fuel pump
6	Coolant pump
7	Engine viscous vibration damper
8	Oil pan
9	Tachometer drive shaft
10	Speedometer drive shaft
11	Engine coolant inlet tube
12	Engine and transmission support
13	Brake apply lever, right
14	Brake apply lever, left
15	Universal joint flange adapter
16	Transmission
17	Transmission throttle valve rod
18	Transmission steer control rod
19	Transmission shift control rod
20	Secondary fuel filter
21	Alternator to rectifier wiring harness
22	Transmission inspection cover (brake adjustment)
23	Surge tank to coolant pump tube
24	Engine oil filters
25	Primary fuel filter
26	Coolant surge tank
27	Backup hydraulic pump

TA310248

POWERPACK TOP VIEW

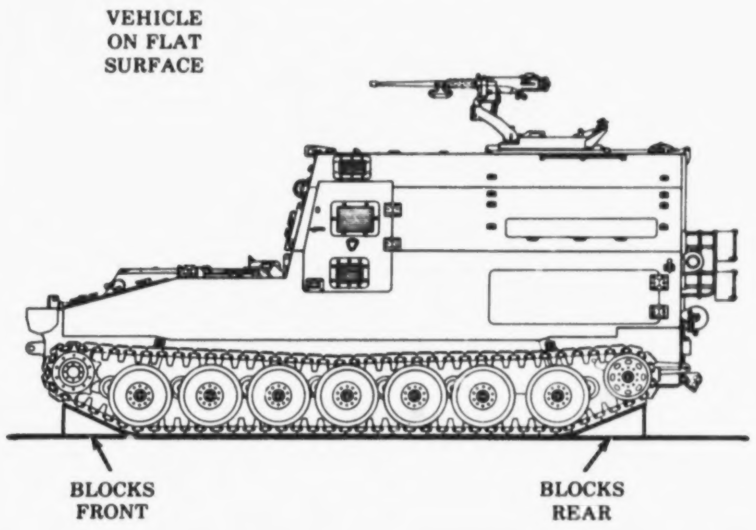


LEGEND

1 Aeration Detector
2 Radiator cooling fan shroud
3 Radiator to surge tank hose
4 Crossover tube to surge tank hose
5 Surge tank pressure relief valve
6 Crossover tube
7 Radiator
8 Radiator filler cap
9 Radiator cooling fans
10 Fuel return line quick-disconnect
11 Inlet thermostat housing
12 Engine coolant temperature transmitter
13 Engine exhaust outlet duct
14 Engine blower inlet housing
15 Turbocharger
16 Lifting eye, engine
17 Engine turbocharger inlet duct
18 Engine governor
19 Engine governor throttle control rod
20 Exhaust crossover tube
21 Air box heater fuel solenoid valve
22 Air box heater motor and pump assembly
23 Engine exhaust manifold, right
24 Engine oil level dipstick and cap assembly
25 Transmission breather tube
26 Bypass thermostat housing

TA310249

POWERPACK: PRELIMINARY REMOVAL PROCEDURES



A Check equipment to be used to remove the powerpack unit. It must have a lifting capacity of at least 7500 pounds, reach at least 9 feet and lift at least 10 feet. It should be movable, or provisions must be made to move the vehicle as the powerpack is removed.

B Open transmission access doors and check universal joint screws. Screws must be in a position to be removed easily. If not, move vehicle until screws can be easily accessed.

C Provide an area 8 feet by 10 feet near the track for the powerpack after removal.

D Provide a stand or frame to hold the powerpack after removal. If unavailable, set the powerpack on wood blocks (p 3-24).

CAUTION

Tracks must be blocked so that the vehicle will not roll out of control. When the powerpack is disconnected, the vehicle is without brakes.

E Move vehicle to level surface. Secure with blocks under tracks.

F Place MASTER switch in OFF position.

G Disconnect both battery ground cables (p 6-44).

H Release parking brake. Place transmission in R2. Move steering wheel to right position.

I Move throttle to full open position so it is easier to disconnect throttle linkage.

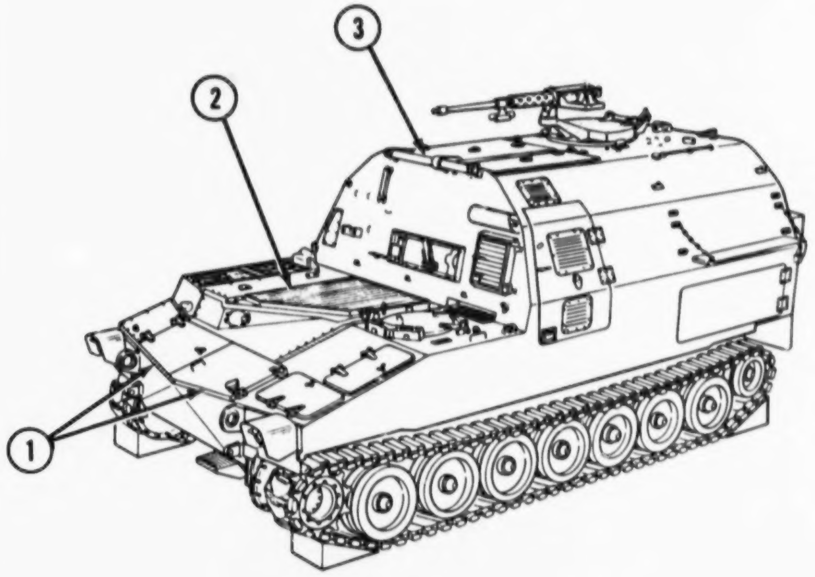
WARNING

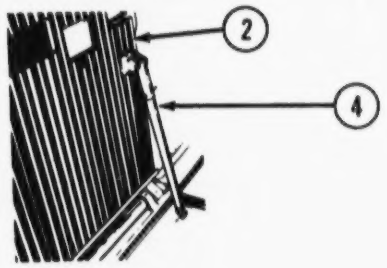
A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when engine is in ground hop mode. Contact with rotating fan can cause injury.

J Install radiator fan protective screen (p 2-5).

TA57641

HULL (EXTERIOR) ACCESS DOORS AND GRILLES: REMOVAL AND INSTALLATION





REMOVAL

WARNING

Access doors are heavy. Use suitable lifting equipment and handle them carefully.

A Open transmission access doors (1).

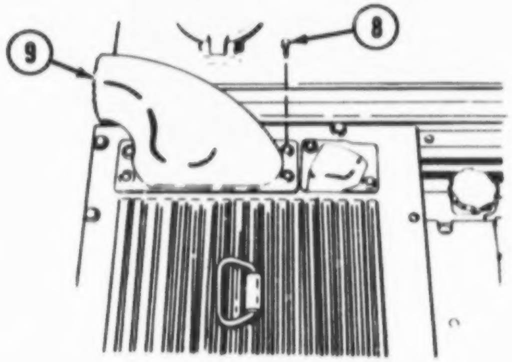
B Open air intake grille (2) and secure to top door torsion bar cover (3) with rope/strap.

NOTE

Secure grille when hold-open support arm (4) is not used.

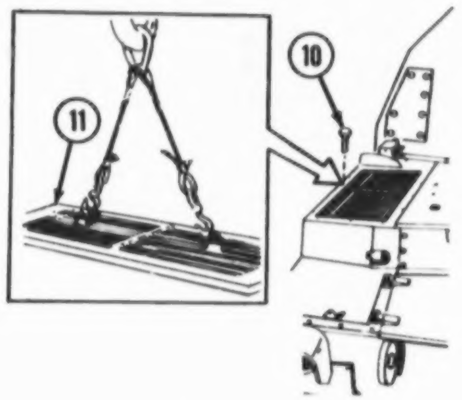
TA310251

HULL (EXTERIOR) ACCESS DOORS AND GRILLES: REMOVAL AND INSTALLATION (CONTINUED)



C Remove four screws (8) and engine exhaust deflector (9).

D Remove and discard packing from deflector seat.



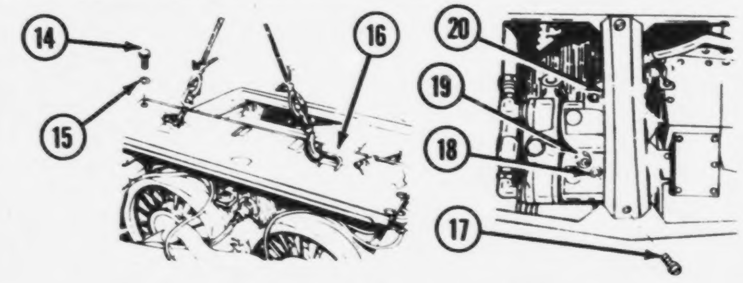
E Remove 14 screws (10) and engine exhaust grille (11).

NOTE

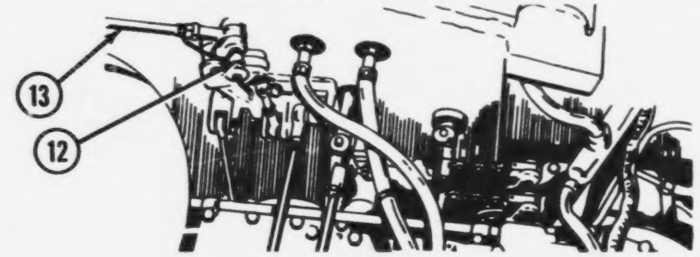
Each grille has different length bolts. Keep bolts with grille after removal.

TA310252

HULL (EXTERIOR) ACCESS DOORS AND GRILLES: REMOVAL AND INSTALLATION (CONTINUED)



POWERPLANT—LEFT BULKHEAD



F Disconnect AFES thermal wire (p 14-27) before proceeding to step G.

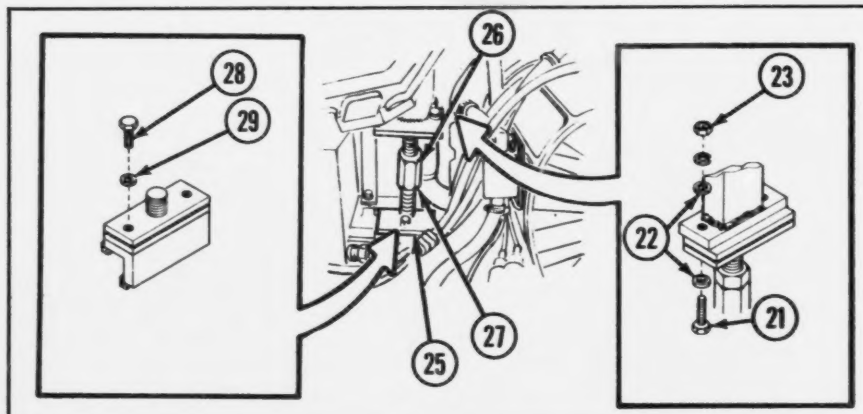
G Pull quick-disconnect pin (12) to release throttle rod (13). Position throttle rod out of the way to avoid catching rod on underside of deck bracket during deck removal.

CAUTION

Do not set radiator fan access door down on AFES thermal wire. Set door on blocks to avoid damaging wire.

H Remove six screws (14), six washers (15) and radiator fan access door (16).

I Remove two screws (17), two flat washers (18) and two hex nuts (19), and remove transmission door support (20).



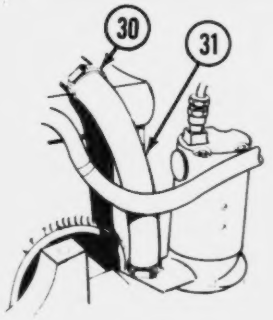
J Remove two screws (21), four flat washers (22), two nuts (23) and two lockwashers (24) from grille support (25).

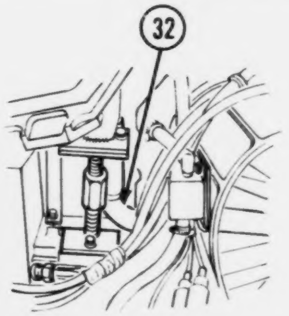
K Loosen jam nut (26) and turn grille support adjustment nut (27) counterclockwise to shorten support assembly and relieve load on support (25).

L Remove two screws (28), two flat washers (29), and remove support assembly (25) from vehicle.

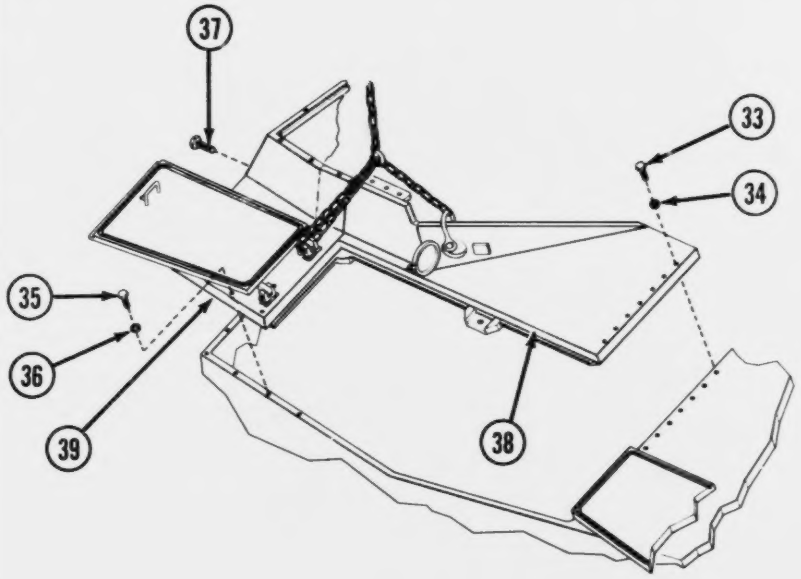
TA310253

HULL (EXTERIOR) ACCESS DOORS AND GRILLES: REMOVAL AND INSTALLATION (CONTINUED)





M Loosen hose clamp (30) and pull hose (31) away from connector tube (32).



CAUTION

Be careful when setting slope plate and air intake grille on floor; avoid damaging attached thermal wire.

N Remove seven screws (33) and seven flat washers (34).

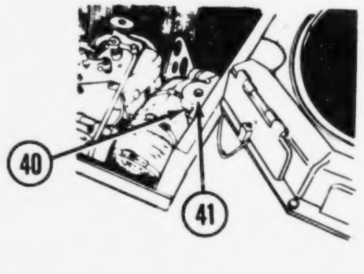
O Remove seven screws (35) and seven flat washers (36).

P Remove seven screws (37).

Q Install lifting device to front slope plate (38) and attached air intake grille (39) as shown. Carefully lift decks from vehicle.

TA310254

HULL (EXTERIOR) ACCESS DOORS AND GRILLES: REMOVAL AND INSTALLATION (CONTINUED)



R Remove two screws (40) and air intake grille handle bracket (41) from vehicle.

INSTALLATION

Install in reverse order of removal.

TA310255

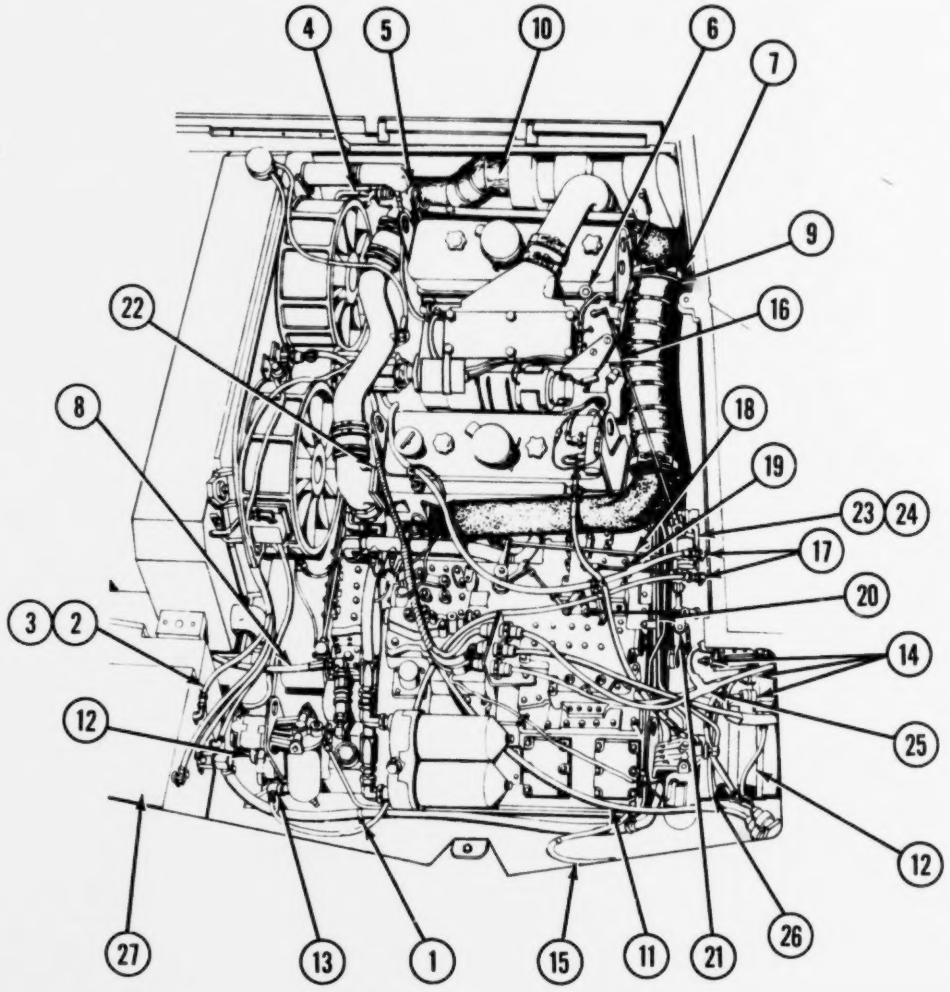
POWERPACK DISCONNECT POINTS IN HULL (POWERPACK IN VEHICLE)

NOTE

Refer to appropriate item for required actions.

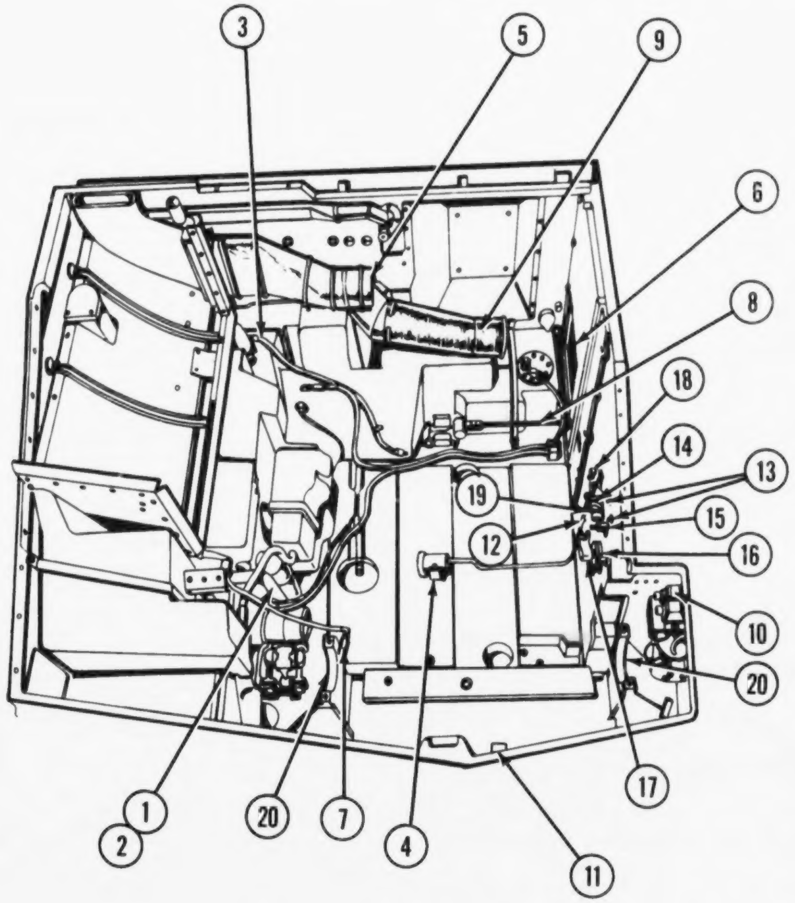
LEGEND

1 Coolant pump to surge tank hose clamps
2 Bilge pump hose
3 Tube and clamp
4 Engine to lower fuel tank return hose and clamp
5 Engine exhaust pipe flanges
6 Governor fuel shutoff lever, pulley and cable
7 Engine compartment access door
8 Primary fuel filter input hose
9 Engine mount release shaft
10 Air cleaner duct hose at turbocharger
11 Generator to rectifier harness (at rectifier)
12 Final drive universal joints
13 Speedometer right angle rod
14 Master relay and voltage regulator disconnects
15 Powerpack ground cable
16 Throttle governor control rod
17 Tachometer and speedometer flexible drive shafts
18 Throttle governor control rod (linkage)
19 Steer control rod
20 Shift control rod
21 Brake control sprocket, shaft and pin
22 Separation of starter cable and generator to rectifier harness
23 Throttle control tube
24 Accelerator and throttle control bracket
25 Engine starter cable, master circuit, and STE/ICE harness
26 Transmission support caps
27 Coolant surge tank, retainer and pad



TA310256

POWERPACK DISCONNECT POINTS (POWERPACK OUT OF VEHICLE)



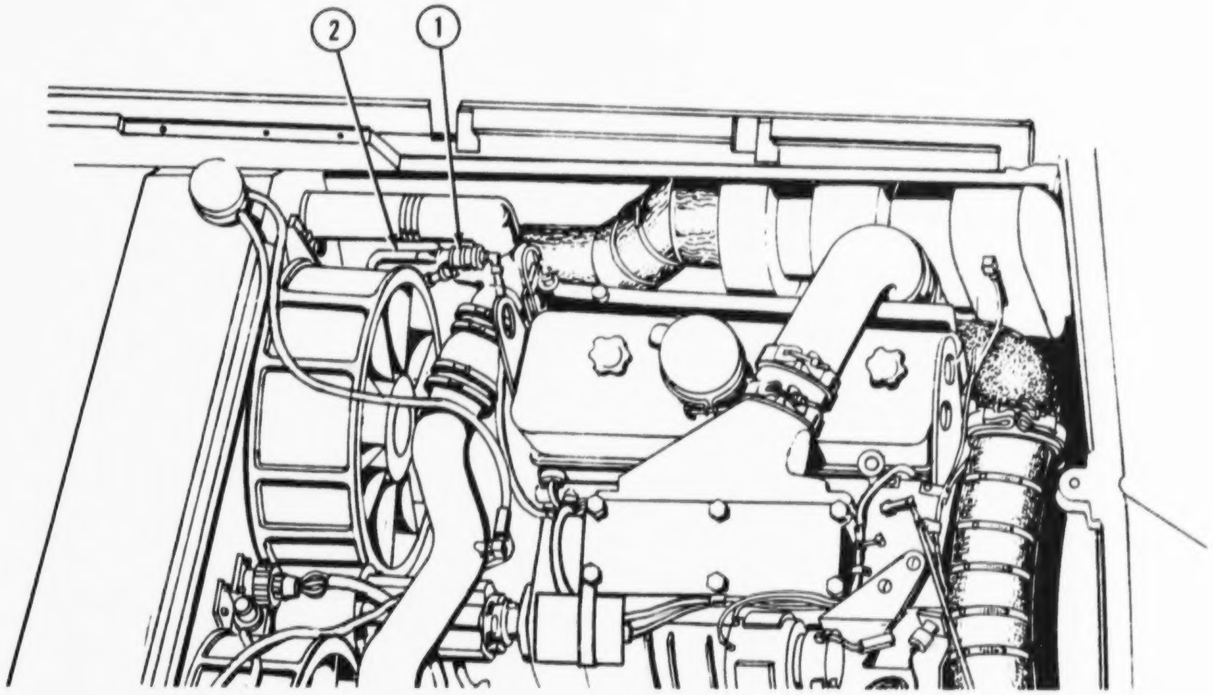
LEGEND

1 Bilge pump hose
2 Tube
3 Engine to lower fuel tank return hose
4 Fixed fire extinguisher nozzle
5 Engine exhaust pipe flanges
6 Engine compartment access door
7 Primary fuel filter input hose
8 Engine mount release shaft
9 Air cleaner duct hose
10 Master relay and voltage regulator
11 Powerpack ground cable terminal
12 Throttle governor control rod
13 Tachometer and speedometer flexible drive shafts
14 Throttle valve control rod (linkage)
15 Steer control rod
16 Shift control rod
17 Brake control sprocket and shaft
18 Throttle control tube
19 Accelerator and throttle control bracket
20 Transmission support caps

ADDITIONAL DISCONNECT
POINTS NOT SHOWN
Engine starter cable and master circuit harness (on transmission)

TA310257

ENGINE TO LOWER FUEL TANK RETURN HOSE: REMOVAL AND INSTALLATION



REMOVAL

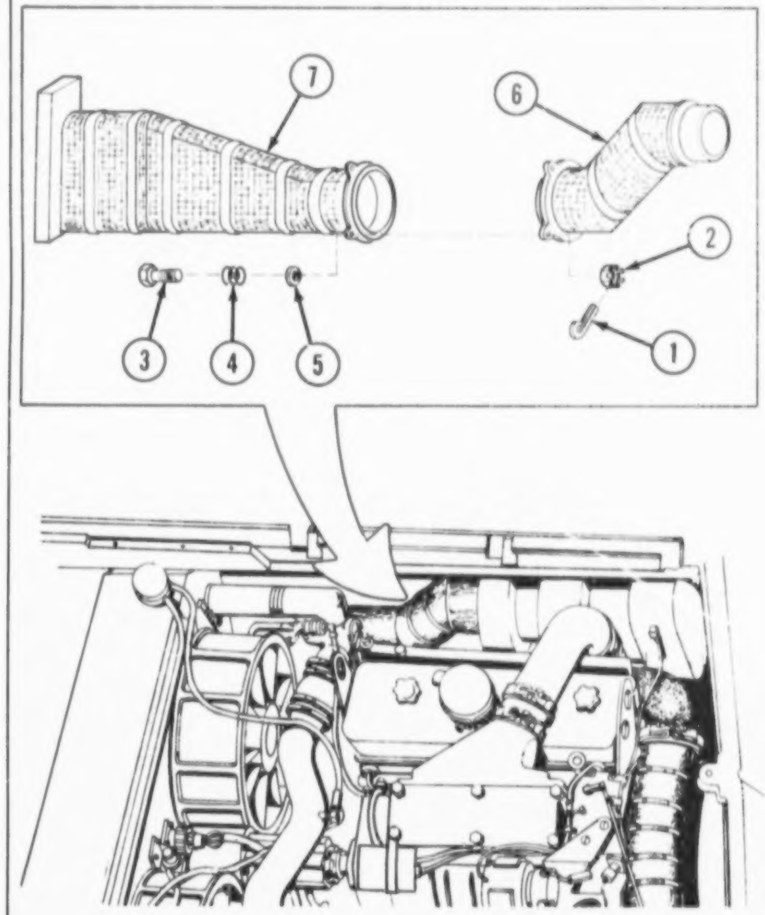
Disconnect hose quick-disconnect assembly (1) from engine to lower fuel tank return hose (2).

INSTALLATION

Install in reverse order.

TA312715

EXHAUST PIPE DISCONNECT



DISCONNECT

A Remove three cotter pins (1) from slotted nuts (2).

B Remove three bolts (3), three springs (4), three flat washers (5) and three slotted nuts (2).

C Separate exhaust pipe (6) and exhaust duct (7).

CONNECT

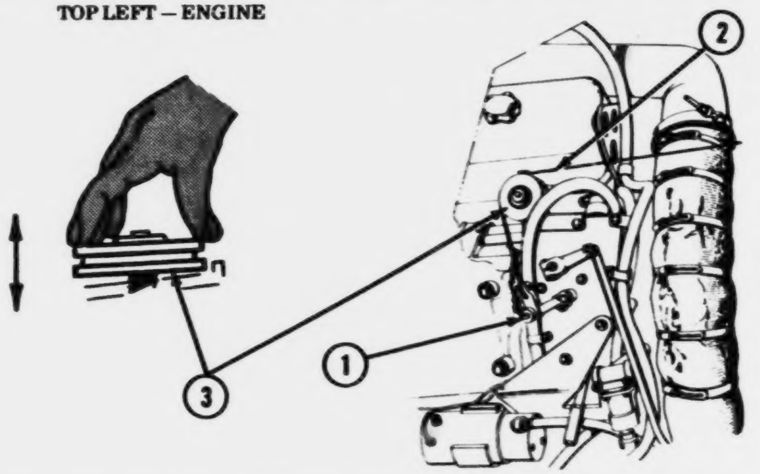
A Connect exhaust pipe (6) and exhaust duct (7) and secure using three bolts (3), three springs (4), three flat washers (5) and three slotted nuts (2).

B Install three new cotter pins (1) on slotted nuts (2).

TA312716

GOVERNOR FUEL SHUTOFF CABLE: REMOVAL AND INSTALLATION

TOP LEFT – ENGINE



REMOVAL

A Pull out quick-release pin (1) from governor fuel shutoff cable (2).

B Pull spring-loaded pulley (3) up and remove cable (2). Allow pulley (3) to drop back down.

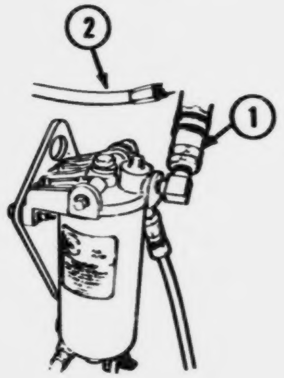
C Lay cable (2) on hull.

INSTALLATION

Install in reverse order of removal procedure.

PRIMARY FUEL FILTER INPUT HOSE: REMOVAL AND INSTALLATION

TOP RIGHT – ENGINE



REMOVAL

A Remove quick-disconnect (1) from primary fuel filter input hose (2).

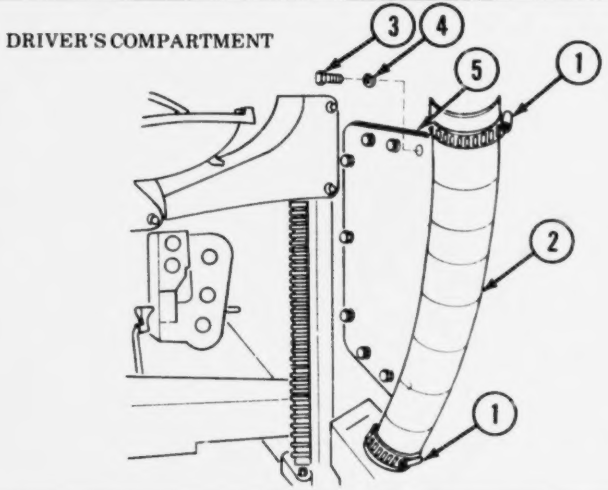
B Disconnect hose (2).

INSTALLATION

Install in reverse order of removal procedure.

TA310259

ENGINE COMPARTMENT ACCESS COVER: REMOVAL AND INSTALLATION


DRIVER'S COMPARTMENT
3
4
5
1
2
1

REMOVAL

A Loosen clamps (1) and remove hose (2).

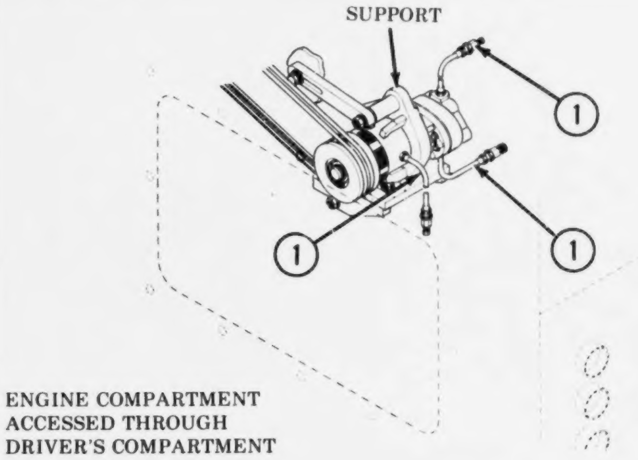
B Remove 12 screws (3), 12 lockwashers (4), access door (5) and gasket (hidden). Discard lockwashers.

INSTALLATION

A Install gasket (hidden) and access door (5) with 12 new lockwashers (4) and 12 screws (3).

B Install hose (2) and tighten clamps (1).

BACKUP HYDRAULIC PUMP HOSES: DISCONNECT AND CONNECT


SUPPORT
1
1
1
ENGINE COMPARTMENT
ACCESSED THROUGH
DRIVER'S COMPARTMENT

DISCONNECT

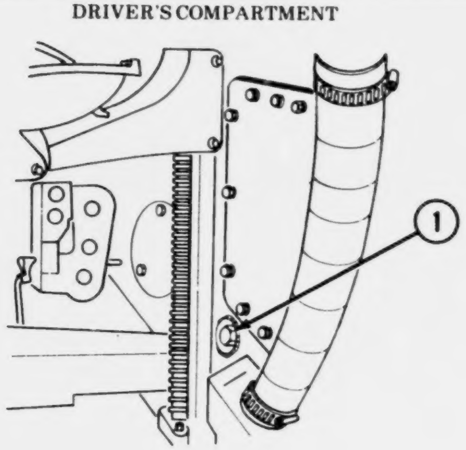
Disconnect three hydraulic hoses (1) at the rear engine compartment bulkhead, at three quick-disconnects.

CONNECT

Connect three hydraulic hoses (1) at the rear engine compartment bulkhead, at three quick-disconnects.

TA312717

ENGINE MOUNT: RELEASE AND CONNECT



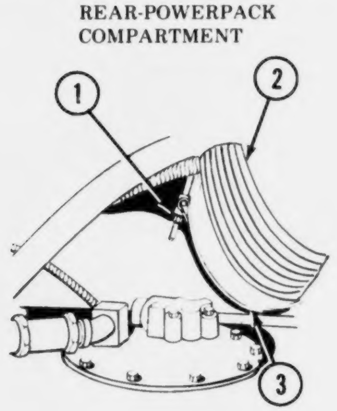
RELEASE

Loosen engine mount release bar (1) by turning counterclockwise to release engine mount.

CONNECT

Tighten engine mount by turning engine mount release bar (1) clockwise. Tighten to 175-190 lb-ft.

AIR CLEANER DUCT: REMOVAL AND INSTALLATION



REMOVAL

A Loosen nut (1) on air cleaner duct (2).

NOTE

Access through driver's compartment access door.

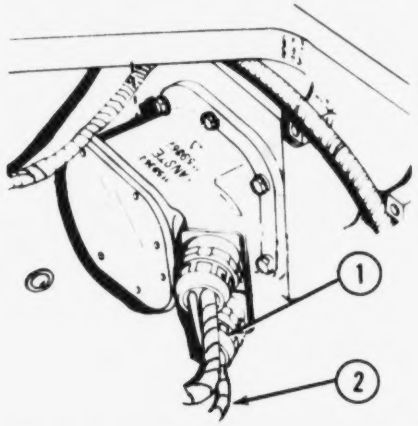
B Remove clamp (3) from air cleaner duct (2).

INSTALLATION

Install clamp (3) on air cleaner duct (2) and tighten nut (1).

TA312718

GENERATOR TO RECTIFIER HARNESS: REMOVAL AND INSTALLATION



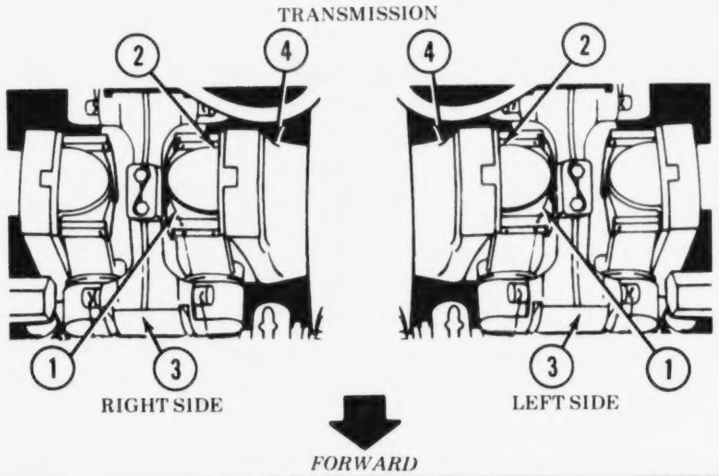
REMOVAL

Disconnect electrical connector (1) from generator to rectifier harness (2).

INSTALLATION

Install in reverse order of removal procedure.

FINAL DRIVE UNIVERSAL JOINTS: REMOVAL AND INSTALLATION



REMOVAL

A Remove two safety wires (1) and four screws (2). Discard safety wire (1).

B Push final drive universal joint (3) away from flange (4).

INSTALLATION

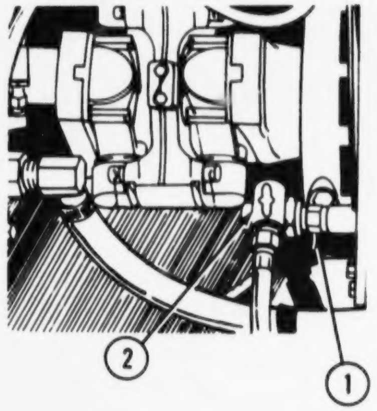
A Install two new safety wires (1).

B Install in reverse order of removal procedure.

TA310262

SPEEDOMETER RIGHT-ANGLE DRIVE: REMOVAL AND INSTALLATION

TRANSMISSION – RIGHT FRONT



REMOVAL

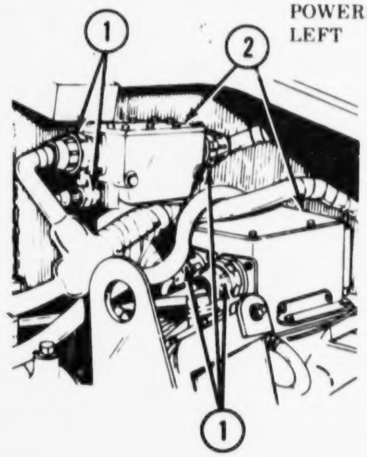
Unscrew nut (1) from speedometer right-angle drive (2).

INSTALLATION

Install in reverse order of removal procedure.

MASTER RELAY, GENERATOR AND REGULATOR: REMOVAL AND INSTALLATION

POWERPACK COMPARTMENT
LEFT



REMOVAL

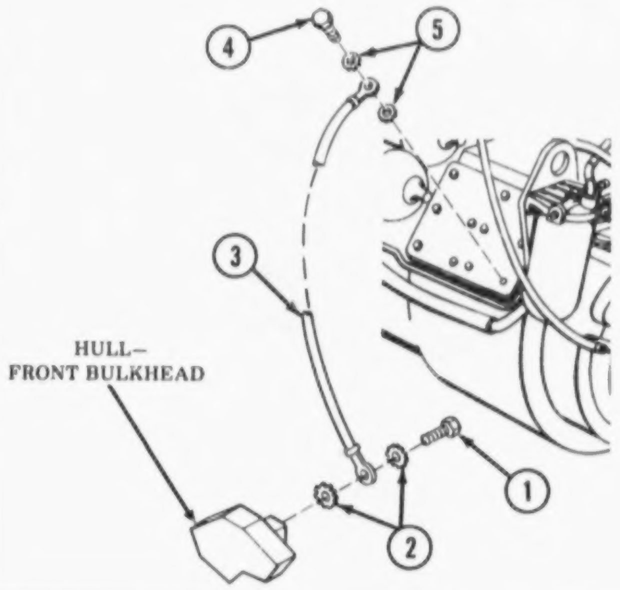
Disconnect five electrical connectors (1) from master relay and regulator (2).

INSTALLATION

Install in reverse order of removal procedures.

TA310263

POWERPACK GROUND WIRE: REMOVAL AND INSTALLATION



REMOVAL

A Open left transmission door.

B Remove screw (1) and two lockwashers (2) to release powerpack ground wire (3) from front hull of vehicle. Discard lockwashers.

C Remove ground wire (3) by removing screw (4) and two lockwashers (5) from transmission. Discard lockwashers.

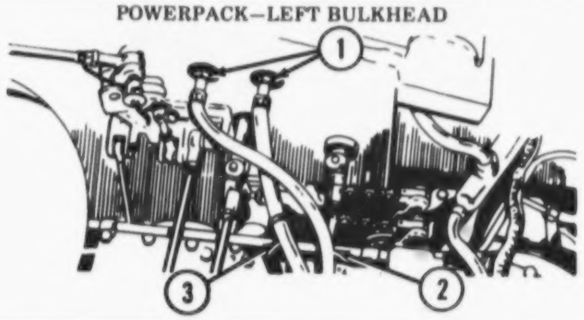
INSTALLATION

A Install ground wire (3) on transmission with two new lockwashers (5) and screw (4).

B Secure ground wire to front hull with two new lockwashers (2) and screw (1).

C Close left transmission door.

TACHOMETER AND SPEEDOMETER FLEXIBLE DRIVE SHAFTS: REMOVAL AND INSTALLATION



REMOVAL

Unscrew two nuts (1) from tachometer flexible drive shaft (2) and speedometer flexible drive shaft (3) and remove.

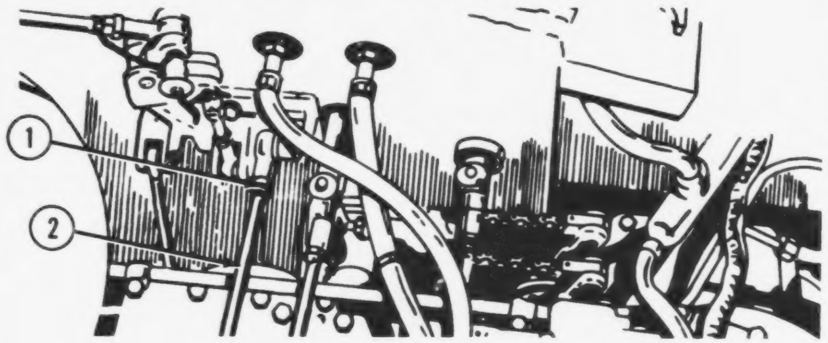
INSTALLATION

Install in reverse order of removal procedure.

TA312719

THROTTLE VALVE CONTROL ROD: REMOVAL AND INSTALLATION

POWERPACK – LEFT BULKHEAD



REMOVAL

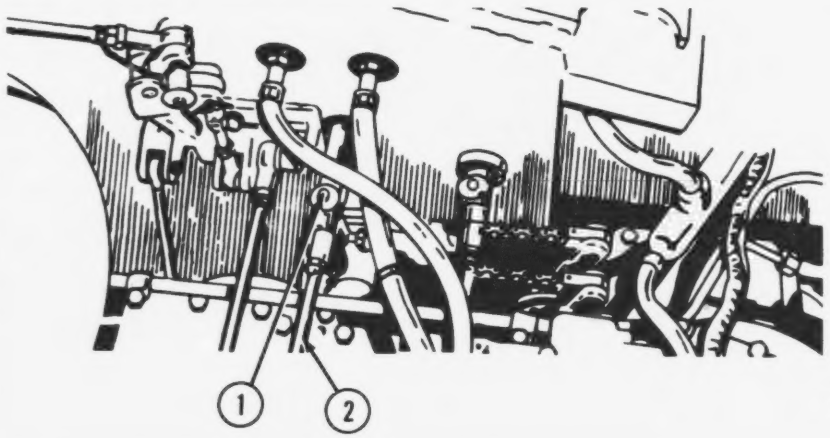
Unscrew nut (1) and remove throttle valve control rod (2).

INSTALLATION

Install in reverse order of removal procedure.

STEER CONTROL ROD: REMOVAL AND INSTALLATION

POWERPACK – LEFT BULKHEAD



CAUTION

After disconnecting, make sure steer and shift control rods are in driver's compartment wall to prevent damage when powerpack is hoisted or reinstalled.

REMOVAL

A Pull out quick-release pin (1) and remove steer control rod (2).

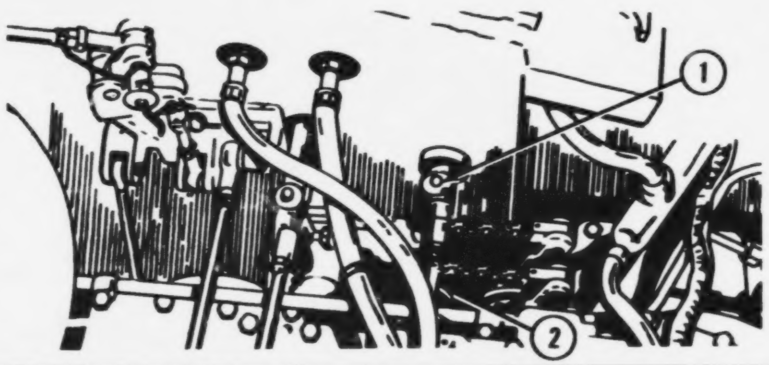
B Move control rod into hull to prevent damage.

INSTALLATION

Install in reverse order of removal procedure.

TA310265

SHIFT CONTROL ROD: REMOVAL AND INSTALLATION


POWERPACK – LEFT BULKHEAD

REMOVAL

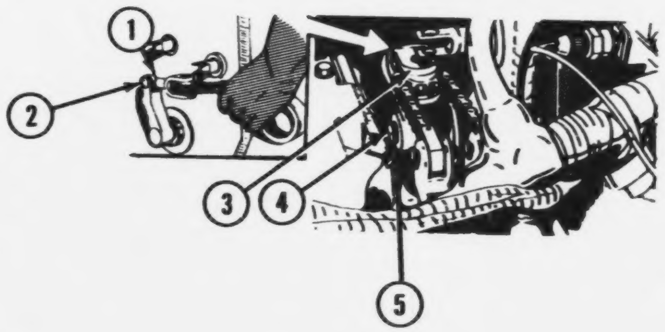
A Pull out quick-release pin (1) and remove shift control rod (2).

B Move control rod into hull to prevent damage. Place shift control lever in R2 position.

INSTALLATION

Install in reverse order of removal procedure.

BRAKE CONTROL SPROCKET AND SHAFT: REMOVAL AND INSTALLATION


POWERPACK – LEFT BULKHEAD

REMOVAL

A Remove cotter pin (1) and retainer pin (2) from brake control sprocket and shaft (3). Discard cotter pin (1).

B Remove brake arm at screw (4) and washer (5).

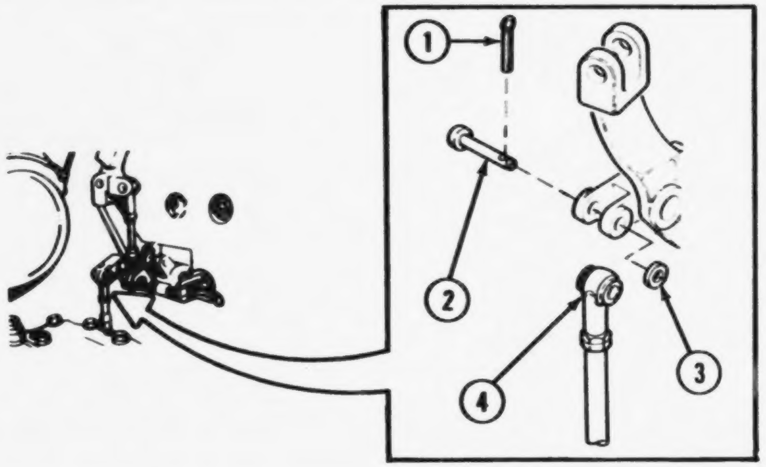
INSTALLATION

A Install in reverse order.

B Install new cotter pin (1).

TA310266

THROTTLE CONTROL TUBE: REMOVAL AND INSTALLATION



REMOVAL

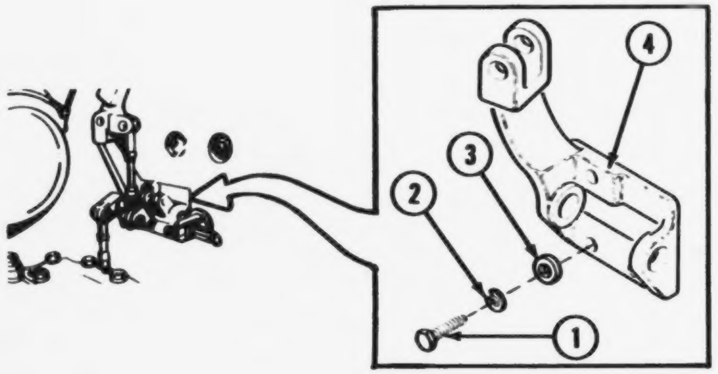
Remove cotter pin (1), retainer pin (2) and washer (3) from throttle control tube (4). Discard cotter pin (1).

INSTALLATION

A Install in reverse order of removal procedure.

B Install new cotter pin (1).

ACCELERATOR AND THROTTLE CONTROL BRACKET: REMOVAL AND INSTALLATION



REMOVAL

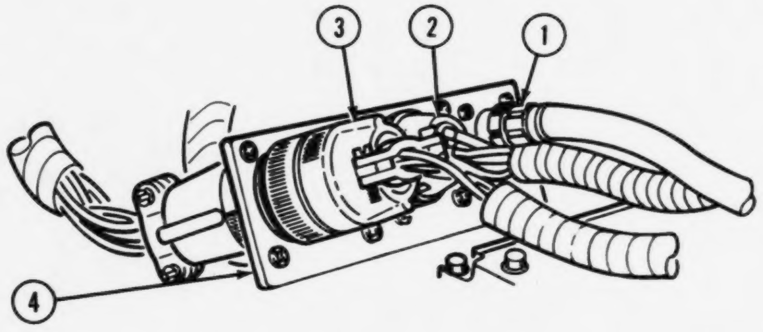
Remove three screws (1), three lockwashers (2), and three flat washers (3) from accelerator and throttle control bracket (4). Remove bracket.

INSTALLATION

Install in reverse order of removal procedure.

TA310267

ENGINE STARTER CABLE AND MASTER CIRCUIT HARNESS: REMOVAL AND INSTALLATION



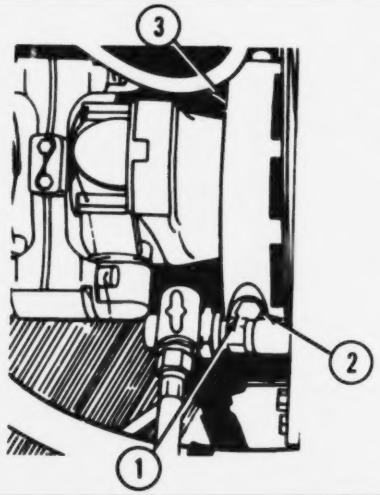
REMOVAL

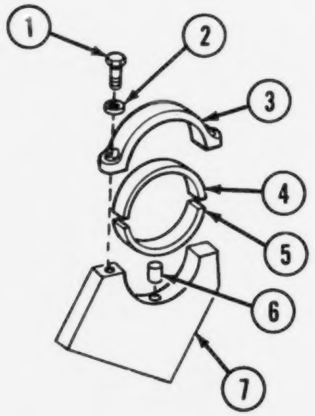
Disconnect starter cable connector (1), master circuit harness connector (2) and STE/ICE harness connector (3) from engine starter cable, master circuit harness and STE/ICE harness engine disconnect bracket (4).

INSTALLATION

Install in reverse order of removal procedure.

TRANSMISSION SUPPORT CAPS: REMOVAL AND INSTALLATION





REMOVAL

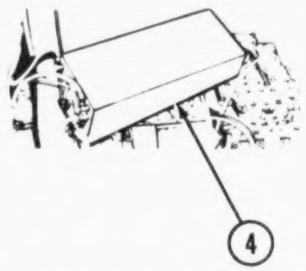
Remove two screws (1), two flat washers (2) and transmission support caps (3) (left and right support assembly). Remove upper inserts (4) if necessary. After powerpack removal, remove lower inserts (5) if necessary. Remove pin (6) from right trunnion mount (7) if necessary.

INSTALLATION

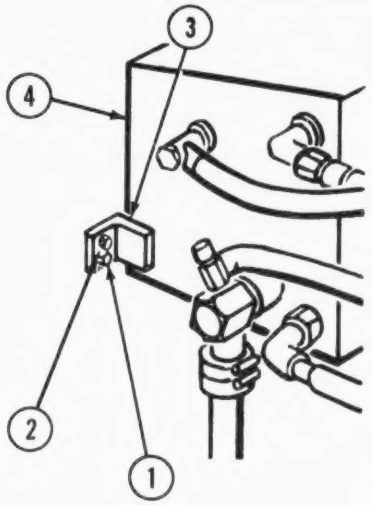
Prior to powerpack installation, install pin (6) on right trunnion mount (7) and lower inserts (5) if removed. Install powerpack. Install upper inserts (4) if removed. Install transmission support caps (3) with two flat washers (2) and two screws (1). Torque screws to 85-90 ft-lb.

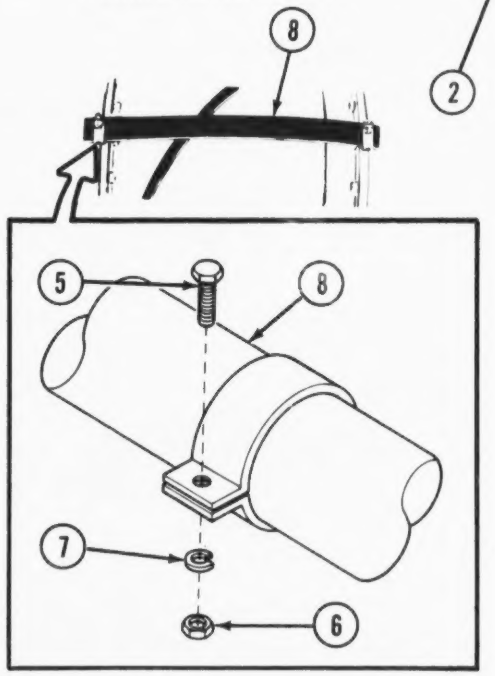
TA312720

COOLANT SURGE TANK: REMOVAL AND INSTALLATION (CONTINUED)



TRANSMISSION – FRONT





REMOVAL

A Remove two screws (1), two lockwashers (2) and retainer pad (3) from coolant surge tank (4).

B Remove two screws (5), two nuts (6) and two lockwashers (7) on coolant pump to surge tank hose (8).

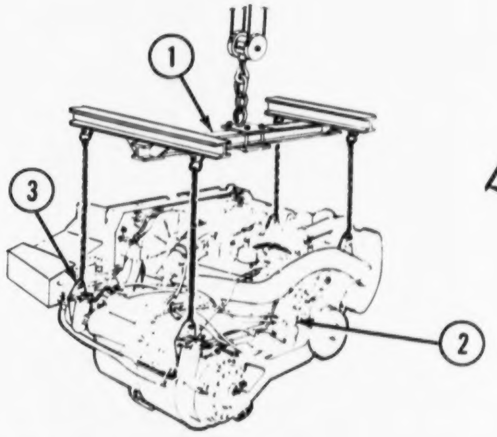
C Place coolant surge tank (4) on top of transmission.

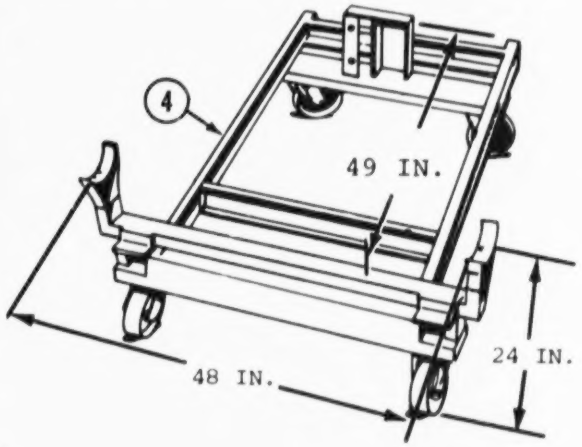
INSTALLATION

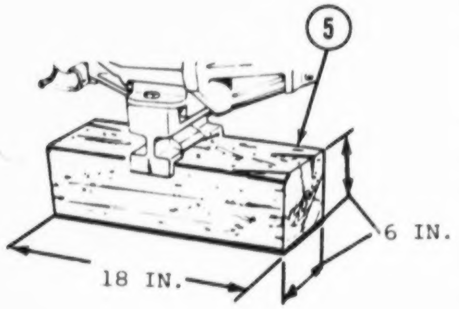
Install in reverse order of removal procedure.

TA310269

POWERPACK: REMOVAL AND INSTALLATION







REMOVAL

NOTES

After lifting powerpack several inches, shift it toward front of vehicle for clearance.

Watch all sides of powerpack to ensure clearance during removal.

A Attach lifting sling (1) to powerpack (2) at lifting eyes (3).

B Lift powerpack (2) slowly out of hull.

C Place on powerpack stand (4) or improvised powerpack stand (5).

INSTALLATION

A Make sure trunnion-cap shims are installed in original location.

B Make sure trunnion caps are installed in proper location as marked on caps (left front and right front), with stamp facing toward front of M992.

NOTE

Primary fuel pump bracket (lifting eye) must be disconnected and removed to install and properly torque right front trunnion cap bolts.

C Torque trunnion cap bolts to 85-90 lb-ft.

D Test run vehicle to check powerpack operation.

E Install in reverse order of removal procedure.

TA310270

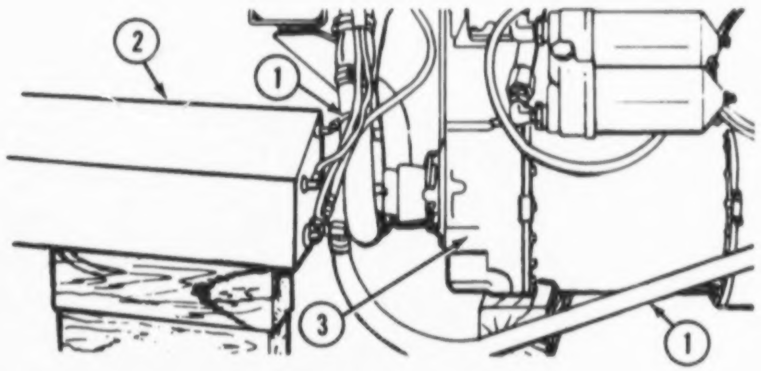
CONTROL AND DRIVE COMPONENTS: INSPECTION

WARNING

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when engine is in ground hop mode. Contact with rotating fan can cause injury.

Operating powerpack out of vehicle lets maintenance personnel inspect control and drive components of powerpack by operating the control linkages on the transmission by hand. Components can be checked for proper functioning and performance with the powerpack unit outside the vehicle without damaging the unit.

COOLANT SYSTEM: SPECIAL EQUIPMENT HOOKUP FOR OPERATION OUT OF VEHICLE



CAUTION

Make sure all hoses are connected and secure.

A Check hoses and connectors (1).

B Position surge tank (2) on left side of the transmission at final drive universal joint (3).

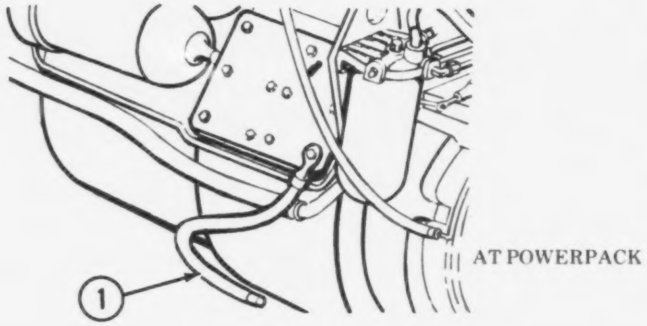
NOTES

Make sure hoses are not kinked.

Make sure coolant and engine lubricant are replenished before starting engine.

TA58111

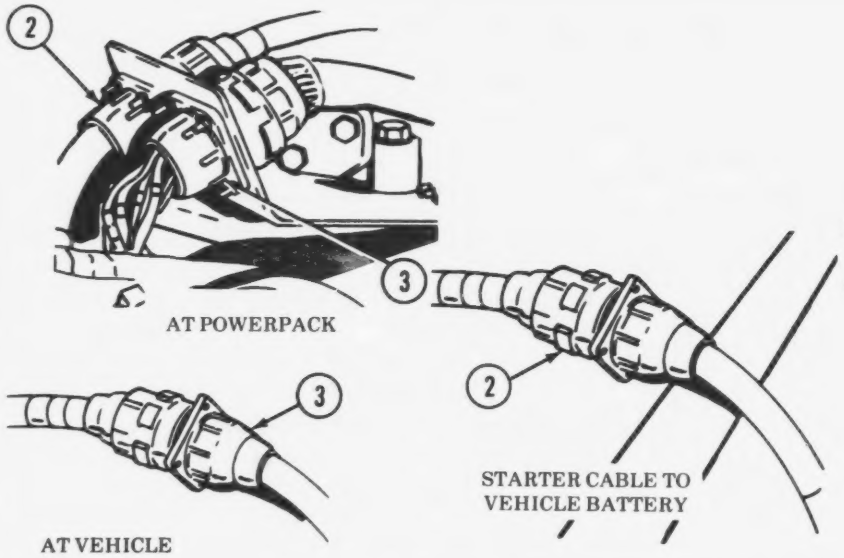
POWERPACK: EQUIPMENT HOOKUPS


1
AT POWERPACK

NOTE

Make sure paint is removed from vehicle at connection point.

A Connect ground cable (1) to powerpack.

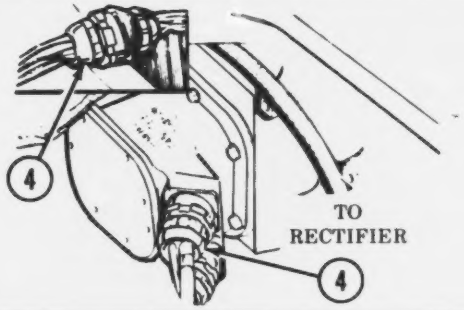

2
3
AT POWERPACK
3
2
STARTER CABLE TO VEHICLE BATTERY
3
AT VEHICLE

B Connect engine starter cable connector (2) to powerpack.

C Connect master circuit power harness connector (3) to powerpack.

TA310272

POWERPACK: EQUIPMENT AND HOOKUPS (CONTINUED)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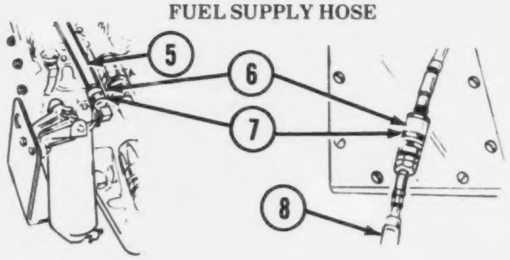
TO
RECTIFIER
4

D Connect generator to rectifier harness connector (4) to powerpack.


FUEL SUPPLY HOSE
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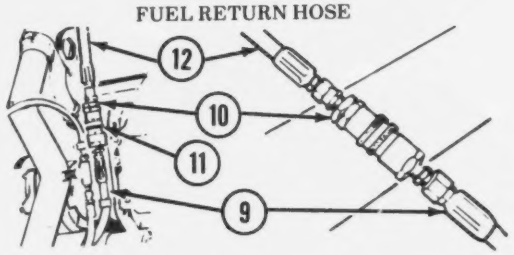
6
7
8

E Install fuel supply hose assembly (5), adapter (6), quick-disconnect (7) and hose (8) to powerpack.


FUEL RETURN HOSE
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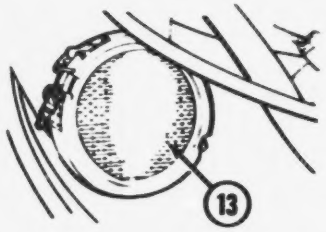
10
11
9

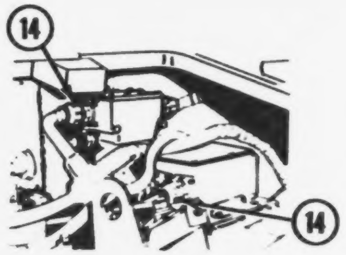
F Install fuel return hose assembly (9), adapter (10), quick-disconnect (11) and hose (12) to powerpack.

TA310273

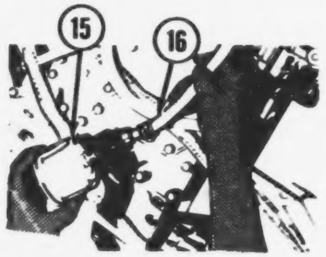
POWERPACK: EQUIPMENT HOOKUPS (CONTINUED)



G Install air inlet screen (13) to powerpack.



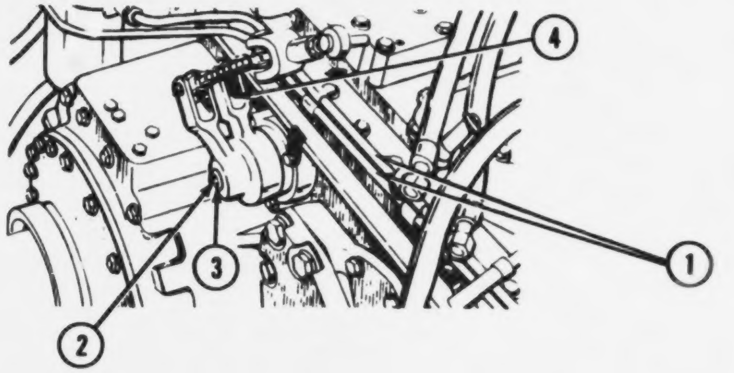
H Connect five wiring harness connectors (14) at master relay and generator regulator.



I Attach tachometer (15) to flexible drive shaft assembly (16).

TA310274

STALL TEST WITH POWERPACK REMOVED — BRAKE TRANSMISSION



CAUTION

When operating the powerpack while mounted on blocks, watch closely to prevent powerpack from vibrating off the blocks.

During stall test, check coolant and oil temperatures. Coolant temperature should not exceed 180°F. Oil temperature should not exceed 250°F. If either condition exists, run engine at 1000-1200 rpm for 2 minutes before shutdown.

NOTE

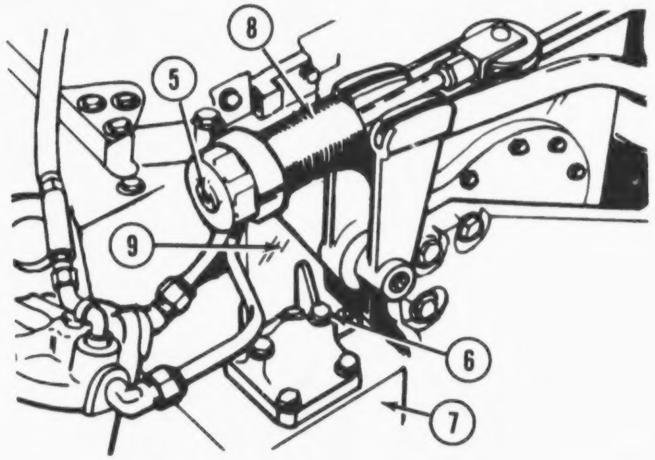
To conduct stall test with engine removed, install brake apply kit. (Brakes must be properly adjusted before conducting stall test p 7-38).

Remove the two fuel filter mounting screws and allow filter to be suspended by the two fuel tubes (1).

A Remove screw (2), flat washer (3) and brake apply lever (4).

TA310275

STALL TEST WITH POWERPACK REMOVED — BRAKE TRANSMISSION (CONTINUED)



B Install brake apply kit (5) and two screws (6) at transmission housing (7).

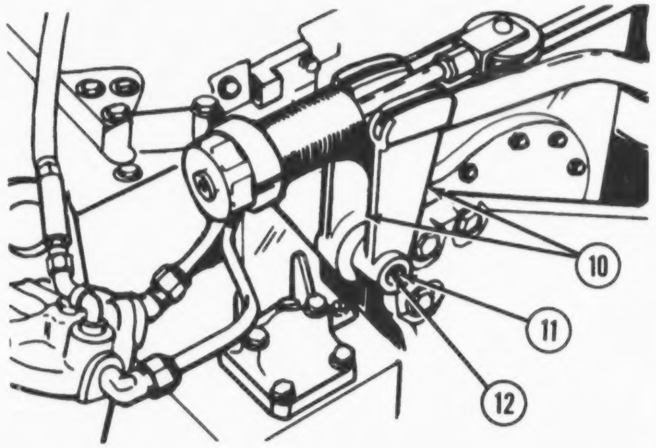
NOTE

Remove and use two screws (6) from transmission housing (7).

C Remove brake apply kit tube (8) from base (9).

NOTE

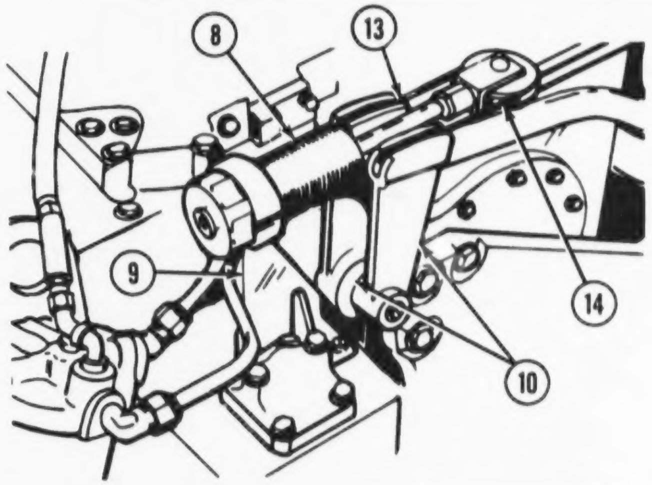
Aline pin in kit levers with blind spline on apply shaft on transmission.



D Attach brake apply kit levers (10) to shaft with screw (11) and washer (12).

TA310276

STALL TEST WITH POWERPACK REMOVED — BRAKE TRANSMISSION (CONTINUED)



E Screw brake apply kit tube (8) into brake apply kit base (9).

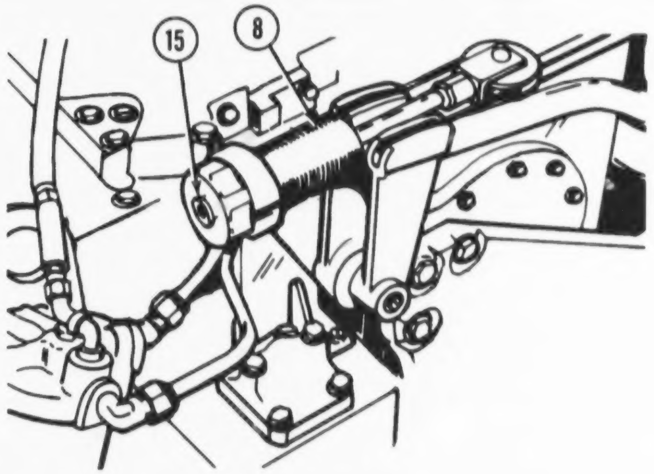
F Position cable (13) in slots of two brake apply kit levers (10) and seat in pulley (14).

G Start engine.

NOTES

Operate at 1200 to 1400 rpm until coolant tank is 169° to 180°F and transmission oil temperature is 160°F.

Allow engine to return to normal idle speed (650 rpm).



H Using a 1/2-inch drive ratchet, rotate brake apply shaft (15) clockwise until threaded section brake apply tube (8) ceases to rotate.

TA310277

STALL TEST WITH POWERPACK REMOVED — ENGINE

A Position transmission shift lever in 4th speed range (high).

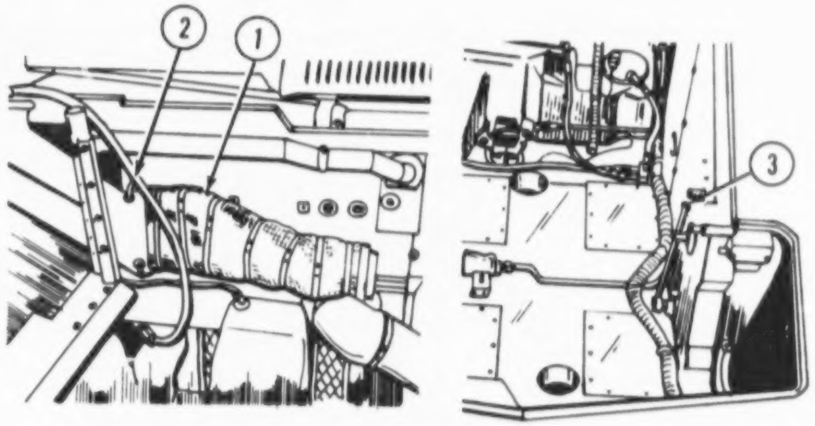
B Move governor control lever to full open throttle.

NOTES

Check engine rpm (1850 rpm minimum). Lower rpm indicates engine malfunction (p 7-6).

Stall speed greater than 2075 rpm indicates transmission malfunction (p 7-6).

POWERPACK INSTALLATION — HULL PREPARATION



NOTE

Lubricate and exercise engine mounting bracket before installing powerpack (LO 9-2350-267-12).

A Position engine exhaust pipe (1) and fuel return hose (2) against powerpack compartment wall (p 3-12).

CAUTION

Failure to secure accelerator/throttle linkage to engine compartment wall may damage linkage.

B Fasten throttle valve control rod linkage (3) to compartment wall (p 3-21).

TA310278

CHAPTER 4
FUEL, AIR INTAKE AND EXHAUST SYSTEMS

Section I FUEL SYSTEM

GENERAL

This section contains instructions on how to remove, disassemble, clean, inspect, assemble, test and install the fuel system. The fuel system consists of the following:

- Electric Fuel Pumps
- Fuel Check Valves
- Fuel Filter Assemblies
- Fuel Tank Level Transmitters
- Hoses, Tubes and Fittings

The maintenance procedures are given under the following headings:

- Draining of Fuel System (p 4-2)
- Heat Shield Removal (p 4-2.1)
- Fuel Hoses, Lines and Fittings Removal (p 4-2.2)
- Fuel Fill Access Plate, Fuel Fill Cap and Fuel Strainer (p 4-5)
- Filler Neck Assembly Seal (p 4-6)
- Filler Neck Removal (p 4-6.1)
- Fuel Tank Level Transmitter (Upper) Removal (p 4-6.2)
- Fuel Tank Level Transmitter (Lower) Removal (p 4-8)
- Fuel Check Valve (Right and Left) (p 4-9)
- Left Electric Fuel Pump Removal (p 4-10)
- Right Electric Fuel Pump Removal (p 4-10.1)
- Fuel Filter Assembly (Primary) Removal (p 4-11)
- Primary Fuel Filter Lifting Bracket (p 4-12.2)
- Fuel Filter Assembly (Secondary) Removal (p 4-13)
- Secondary Fuel Filter Lifting Bracket (p 4-14.2)
- Engine Driven Fuel Pump Removal (p 4-15)
- Electric Fuel Pump Removal (p 4-16)
- Relief Valve Checking and Cleaning (p 4-17)
- Powerpack Fuel Hoses, Tubes, and Connectors Removal (p 4-19)
- Fuel Flow Test (p 4-22)

TA312721

DRAINING OF FUEL SYSTEM

INITIAL SETUP

References:

TM 9-2350-267-10

General Safety Instructions:

No smoking or open flame when working on fuel system.

NOTE

> Fuel tank capacity is 135 gallons. Removing drain plug at bottom of vehicle allows draining of the system in less than 30 minutes.

DRAIN

A Drive vehicle over maintenance pit to provide clearance for 55-gallon containers used to catch fuel.

B Remove three screws (1), three flat washers (2), access cover (3) and gasket (4). Discard gasket.

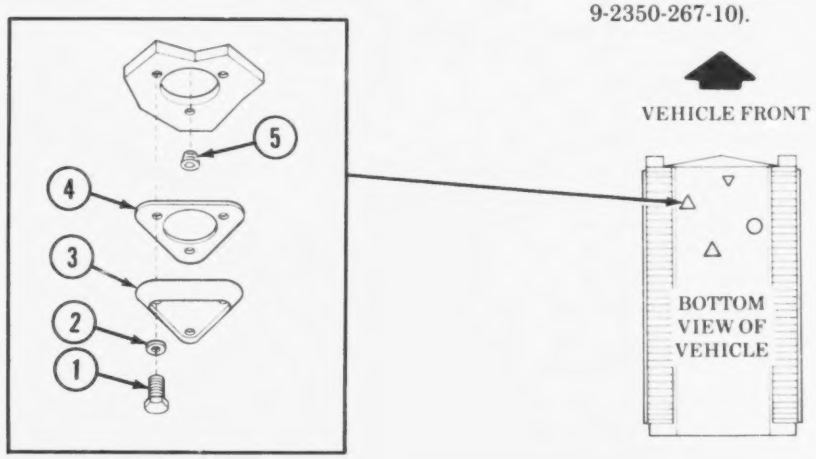
C Remove fuel plug (5) and drain fuel.

REFUEL

A Install fuel plug (5).

B Install new gasket (4) and access cover (3) with three screws (1) and three flat washers (2).

C Move vehicle from maintenance pit and refuel system (TM 9-2350-267-10).



TA312722

■ HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Adhesive (item 4, Appx D)
Sealing compound (item 54, Appx D)
Dry-cleaning solvent (item 20, Appx D)

Personnel Required:

Three

Equipment Condition:

Powerpack removed (p 3-1).
Engine exhaust duct removed (p 4-32).

REMOVAL

A Remove two screws (1), two jamnuts (2) and two brackets (3).

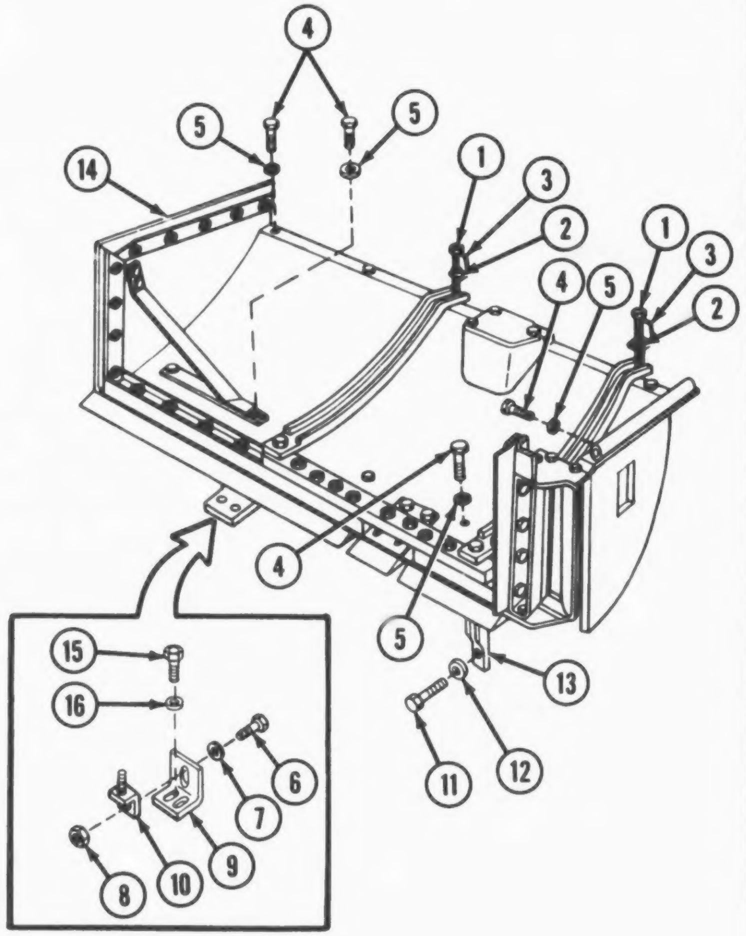
B Remove 11 screws (4) and 11 flat washers (5).

C Remove one screw (6), one flat washer (7) and one locknut (8) to separate bracket (9) from support (10). Discard locknut.

D Remove one screw (11) and one flat washer (12) from support (13).

E Remove fuel tank heat shield (14) from vehicle.

F Remove two screws (15), two flat washers (16), and bracket (9) from vehicle.



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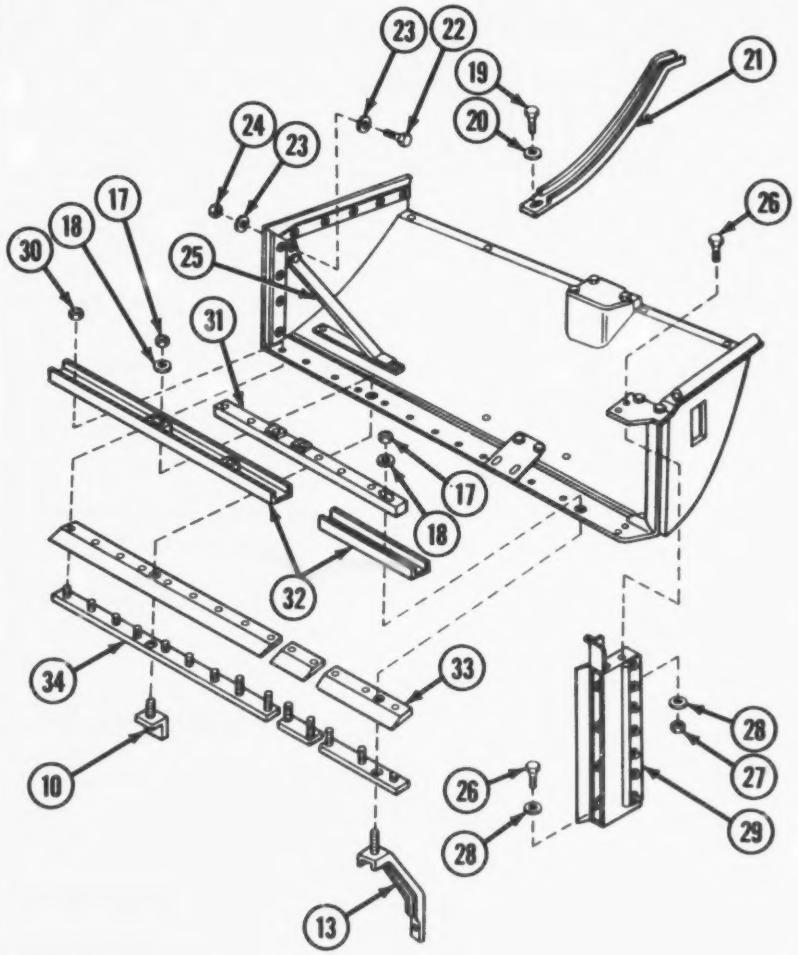
HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove two nuts (17) and two flat washers (18).

B Remove supports (10 and 13).

C Remove two screws (19), two flat washers (20) and two stiffeners (21).

D Remove two screws (22), four flat washers (23), two locknuts (24) and support (25). Discard locknuts.

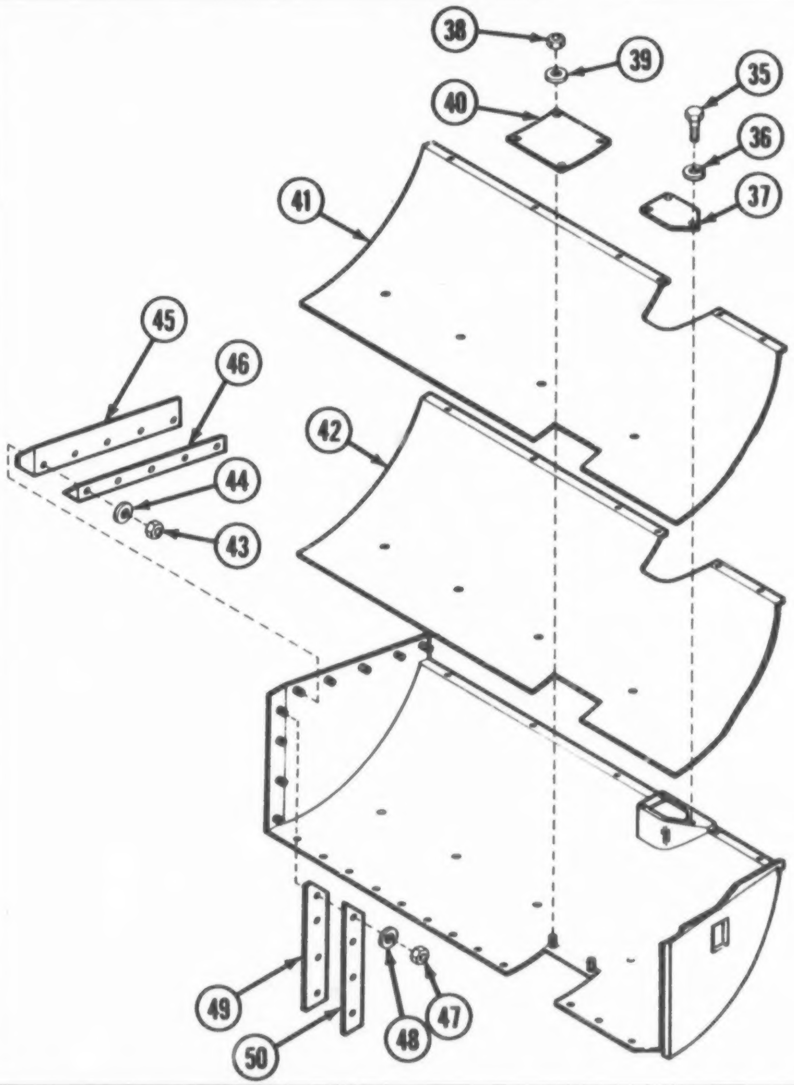
E Remove four screws (26), two locknuts (27), four flat washers (28) and retainer (29). Discard locknuts.

F Remove 14 nuts (30), bar (31) and two stiffeners (32).

G Remove three seal segments (33) and three retainer segments (34).

TA58078

HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)



H Remove three screws (35) and three lockwashers (36). Discard lockwashers.

I Remove cover (37).

J Remove two nuts (38) and two flat washers (39).

K Remove cover (40).

L Remove retainer (41) and insulation (42).

M Remove five nuts (43) and five flat washers (44).

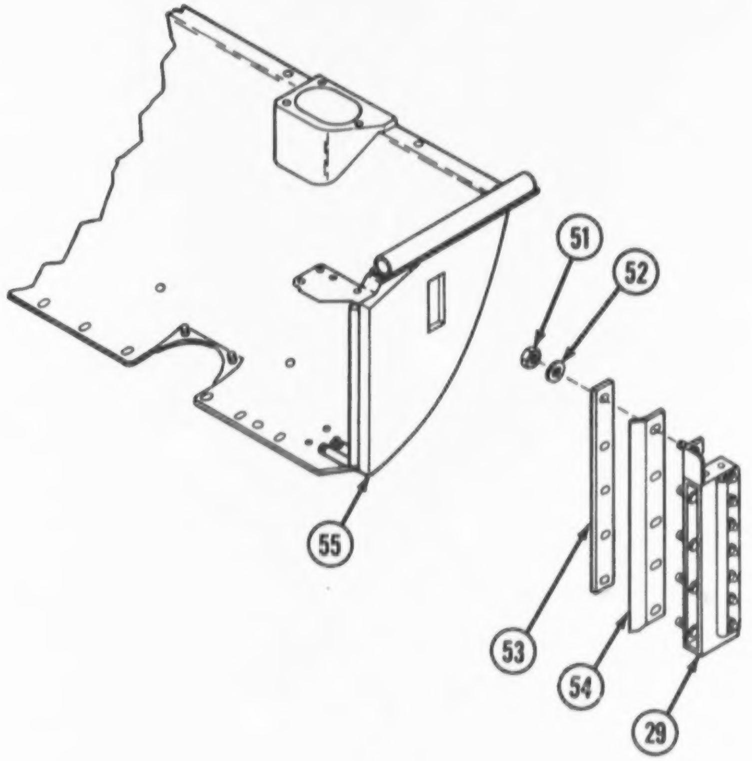
N Remove seal (45) and plate (46).

O Remove four nuts (47) and four flat washers (48).

P Remove seal (49) and plate (50).

TA58060

HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)



Q Remove five nuts (51) and five flat washers (52).

R Remove plate (53) and seal (54) from retainer (29).

S Remove fuel tank heat shield pad (55), using putty knife. Discard pad.

TA58069

HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)

ASSEMBLY

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

A Clean pad mounting surface with dry-cleaning solvent (item 20, Appx D) to remove all residue and adhesive from old pad.

B Apply adhesive (item 4, Appx D) and install new pad (55).

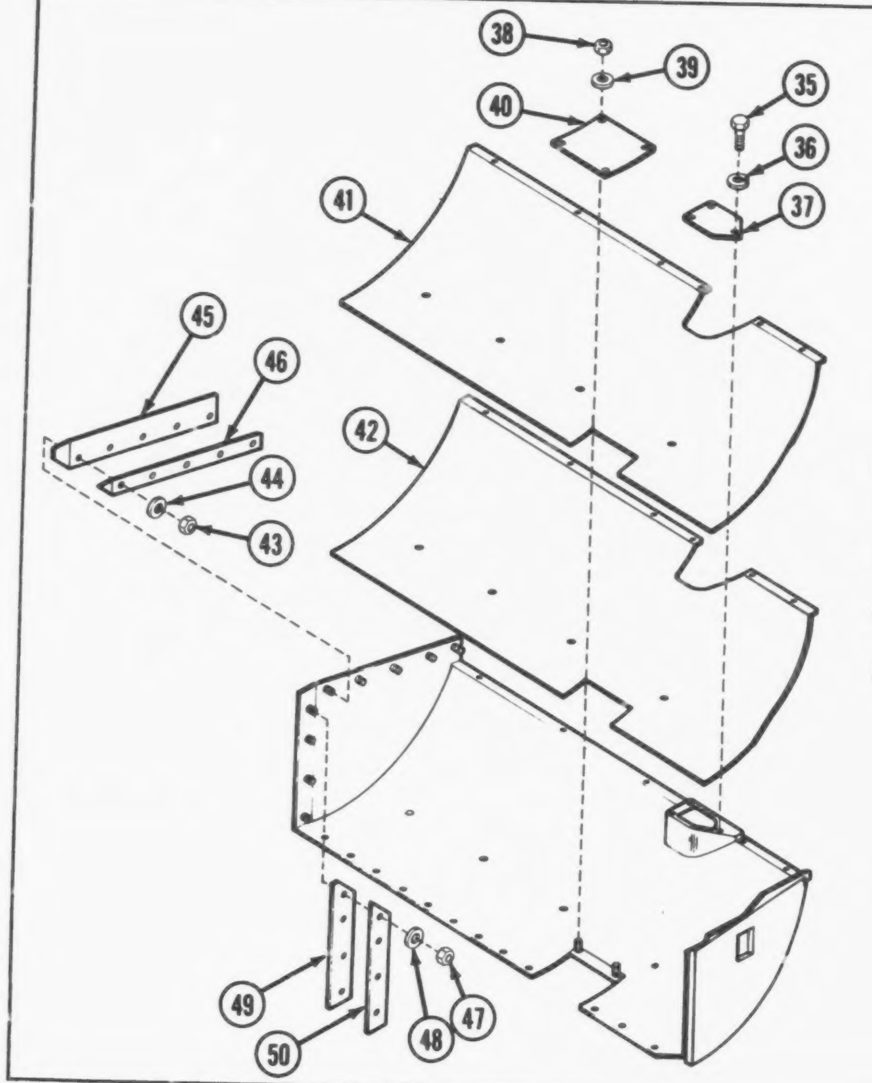
NOTE

Tighten plate and seal nuts tight enough to show slight compression of rubber.

C Install seal (54) and plate (53) on retainer (29) with five flat washers (52) and five nuts (51).

TA58068

HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)



D Install seal (49) and plate (50) with four flat washers (48) and four nuts (47).

E Install seal (45) and plate (46) with five flat washers (44) and five nuts (43).

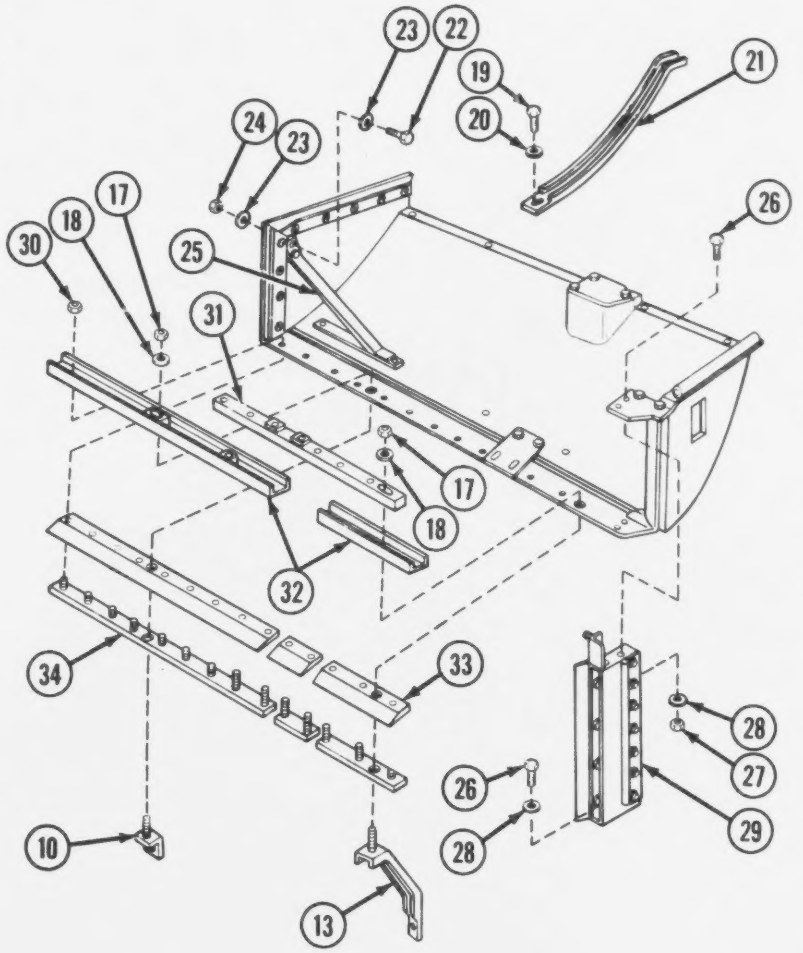
F Install insulation (42) and retainer (41).

G Install cover (40) with two flat washers (39) and two nuts (38).

H Install cover (37) with three new lockwashers (36) and three screws (35).

TA58059

HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)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I Install three seal segments (33) and three retainer segments (34) with two stiffeners (32), bar (31) and 14 nuts (30).

J Install retainer (29) with four screws (26), four flat washers (28), and two new locknuts (27).

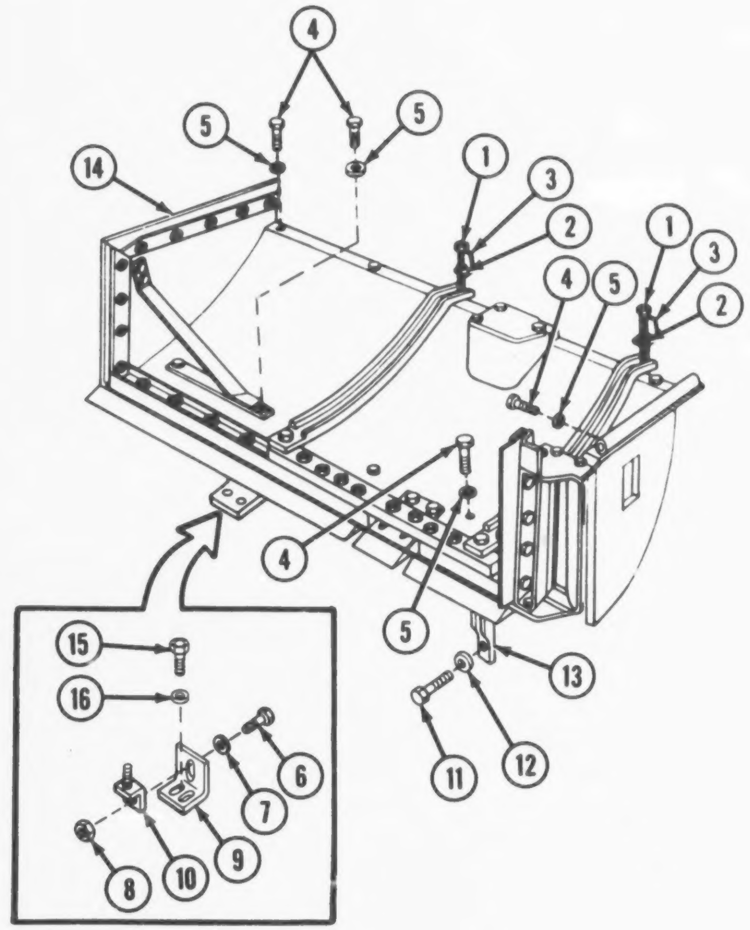
K Install support (25) with two screws (22), four flat washers (23) and two new locknuts (24).

L Install two stiffeners (21) with two screws (19) and two flat washers (20).

M Install, but do not tighten, supports (13 and 10) with two flat washers (18) and two nuts (17).

TA58077 ■

HEAT SHIELD: REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)



INSTALLATION

A Install bracket (9) in vehicle with two flat washers (16) and two screws (15).

B Install fuel tank heat shield (14) in vehicle.

C Install one screw (11) and one flat washer (12) in support (13).

D Connect bracket (9) to support (10) with one flat washer (7), one screw (6) and new locknut (8).

E Install 11 screws (4) and 11 flat washers (5).

F Install two brackets (3) with two screws (1) and two jamnuts (2).

G Tighten nuts (51, hidden).

TA58050

FUEL HOSES, LINES AND FITTINGS: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

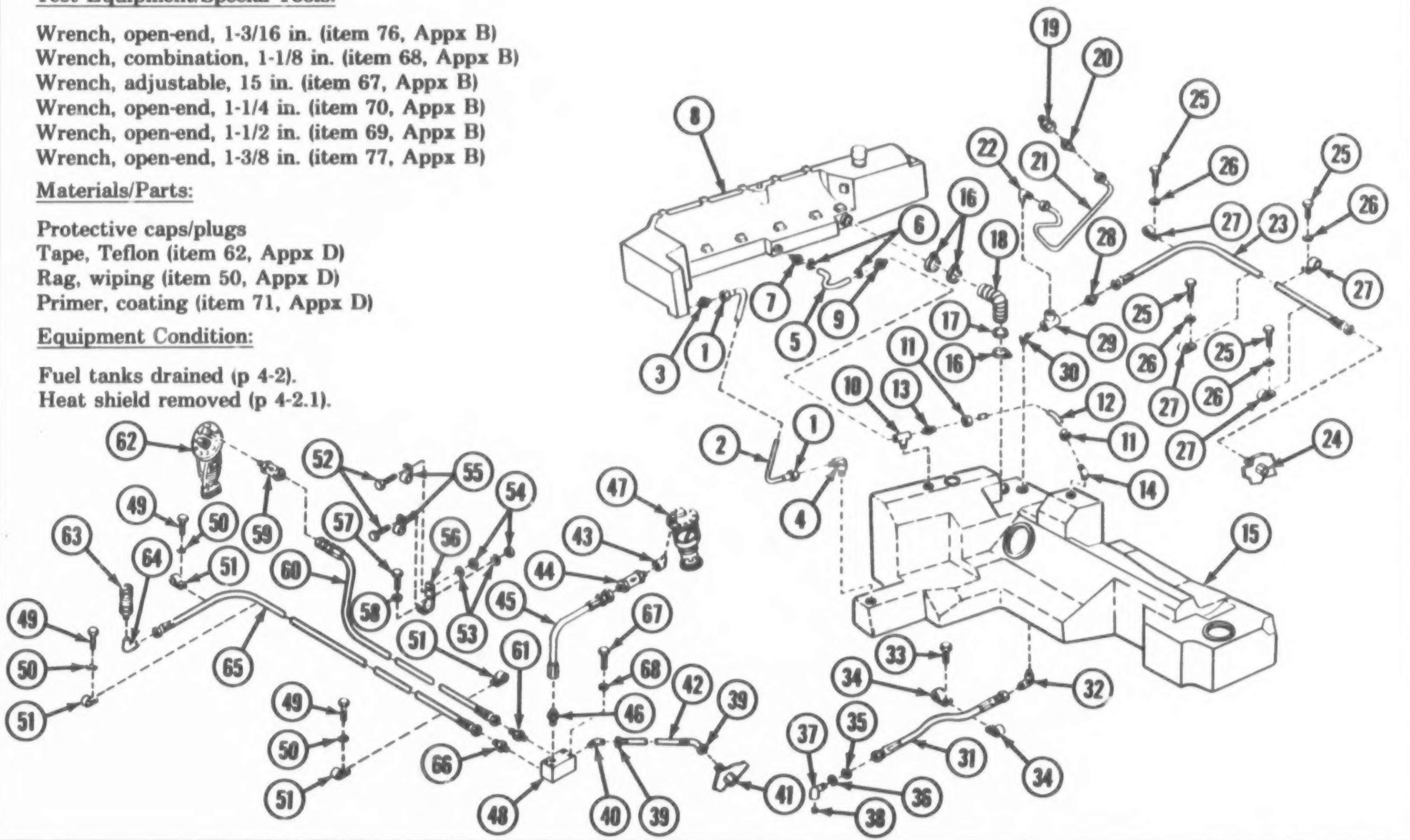
Wrench, open-end, 1-3/16 in. (item 76, Appx B)
Wrench, combination, 1-1/8 in. (item 68, Appx B)
Wrench, adjustable, 15 in. (item 67, Appx B)
Wrench, open-end, 1-1/4 in. (item 70, Appx B)
Wrench, open-end, 1-1/2 in. (item 69, Appx B)
Wrench, open-end, 1-3/8 in. (item 77, Appx B)

Materials/Parts:

Protective caps/plugs
Tape, Teflon (item 62, Appx D)
Rag, wiping (item 50, Appx D)
Primer, coating (item 71, Appx D)

Equipment Condition:

Fuel tanks drained (p 4-2).
Heat shield removed (p 4-2.1).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TA58028

FUEL HOSES, LINES AND FITTINGS: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

- Use protective caps/plugs on all disconnected hoses and fittings.
- Use wiping rags to remove leaked fuel.

A Loosen two swivel nuts (1) and remove crossover hose assembly (2).

B Remove adapter (3) and elbow (4).

C Remove fuel tank breather hose assembly (5) by loosening two hose clamps (6).

D Remove adapter (7) from upper fuel tank (8) and adapter (9) from tee (10).

E Loosen two swivel nuts (11) and remove bent metal tube assembly (12).

F Remove adapter (13), elbow (14) and tee (10) from lower fuel tank (15).

G Remove three hose clamps (16), hose flange (17) and fuel tank filler hose (18).

H Remove coupling (19), adapter (20), engine fuel return hose (21) and elbow (22).

I Disconnect APU fuel return hose (23) at adapter (24).

J Remove four screws (25), four lockwashers (26), and four clamps (27). Discard lockwashers.

K Remove hose (23), adapter (28), tee (29) and elbow (30).

L Disconnect fuel tank drain hose (31) at elbow (32) and remove elbow (32).

M Remove screw (33) and two clamps (34).

N Remove nut (35), flat washer (36) and elbow (37) from drain hose (31).

O Remove pipe plug (38) from elbow (37).

P Loosen two swivel nuts (39) at elbow (40) and adapter (41) and remove fuel supply hose (42) for APU and personnel heater. Remove elbow (40) and adapter (41).

Q Remove elbow (43), check valve (44), fuel tank outlet hose (45) and adapter (46) from fuel pump (47) and fuel distribution terminal fitting (48).

R Remove three screws (49), three lockwashers (50) and four clamps (51). Discard lockwashers.

S Remove two screws (52), two lockwashers (53), two nuts (54) and two clamps (55). Discard lockwashers.

T Remove bracket (56) by removing one screw (57) and one lockwasher (58). Discard lockwasher.

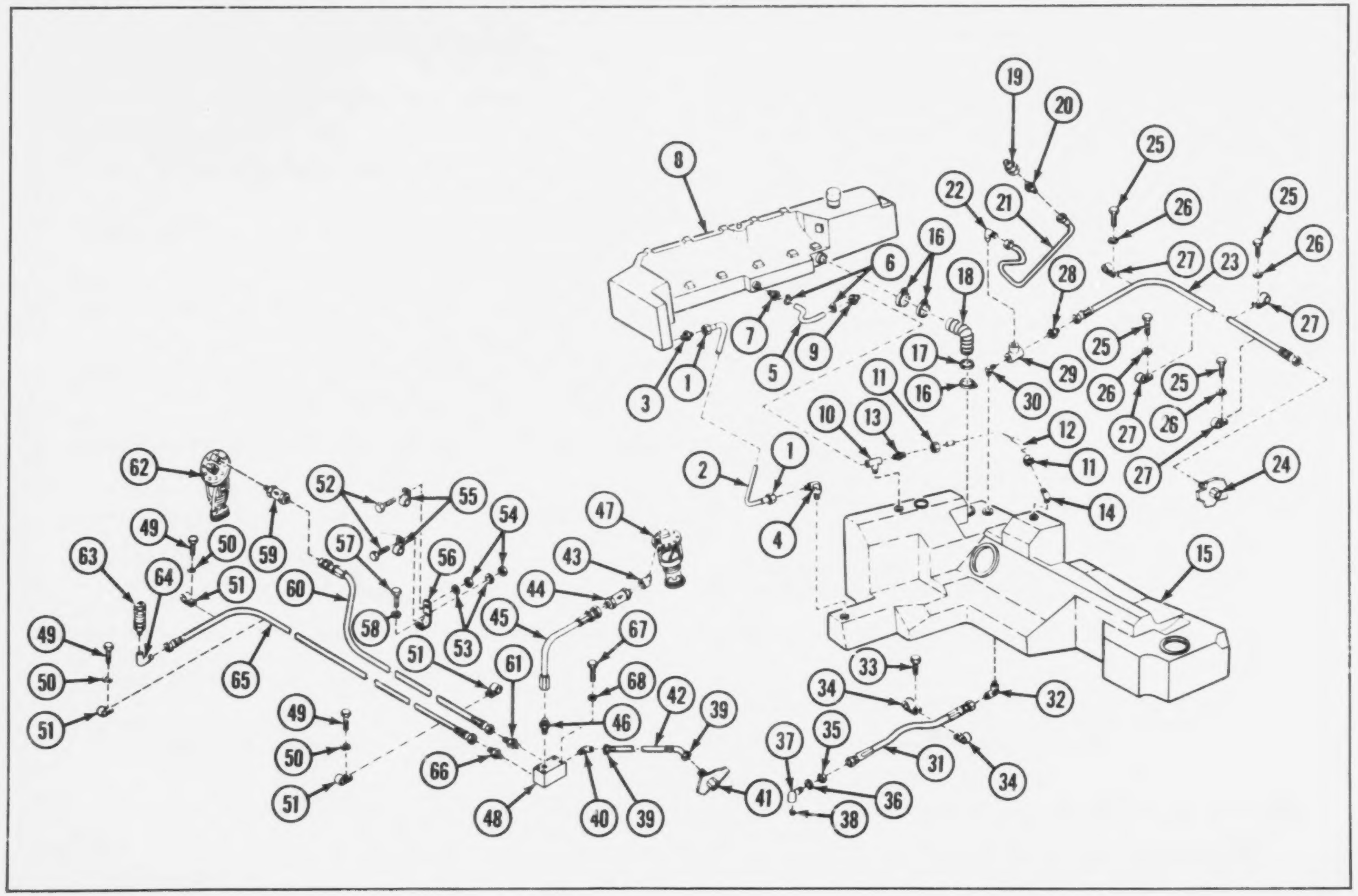
U Remove check valve (59), fuel tank outlet hose (60) and adapter (61) from fuel pump (62) and fuel distribution terminal fitting (48).

V Remove coupling (63), elbow (64), fuel filter inlet hose (65) and adapter (66) from fuel distribution terminal fitting (48).

W Remove fuel distribution terminal fitting (48) by removing four screws (67) and four lockwashers (68). Discard lockwashers.

TA58018

FUEL HOSES, LINES AND FITTINGS: REMOVAL AND INSTALLATION (CONTINUED)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FUEL HOSES, LINES AND FITTINGS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

NOTE

- Apply coating primer (item 71, Appx D) to contacting surfaces of adapters (24 and 41).
- Apply Teflon tape (item 62, Appx D) to all male pipe threads during installation.

A Install fuel distribution terminal fitting (48) with four screws (67) and four new lockwashers (68).

B Install adapter (66), fuel filter inlet hose (65), elbow (64) and coupling (63) on fuel distribution terminal fitting (48).

C Install check valve (59), fuel tank outlet hose (60) and adapter (61) on fuel pump (62) and fuel distribution terminal fitting (48).

D Install bracket (56) with new lockwasher (58), and screw (57).

E Install two clamps (55) with two screws (52), two new lockwashers (53) and two nuts (54).

F Install four clamps (51) with three screws (49) and three new lockwashers (50).

G Install adapter (46), fuel tank outlet hose (45), check valve (44) and elbow (43) on fuel pump (47) and fuel distribution terminal fitting (48).

H Install elbow (40) on fuel distribution terminal fitting (48).

I Install adapter (41).

J Install APU personnel heater fuel supply hose (42) and tighten two swivel nuts (39) at elbow (40) and adapter (41).

K Install nut (35), flat washer (36) and elbow (37) on drain hose (31).

L Install pipe plug (38) in elbow (37).

M Install elbow (32) and connect fuel tank drain hose (31).

N Install two clamps (34) and screw (33).

O Install elbow (30), tee (29), adapter (28) and hose (23).

P Connect APU fuel return hose (23) at adapter (24).

Q Install four clamps (27) with four screws (25) and four new lockwashers (26).

R Install elbow (22), engine fuel return hose (21), adapter (20) and coupling (19).

S Install fuel tank filler hose (18), hose flange (17) and three hose clamps (16).

T Install tee (10), elbow (14) and adapter (13) on lower fuel tank (15).

U Install bent metal tube assembly (12) and tighten two swivel nuts (11).

V Install adapter (9) on tee (10) and adapter (7) on upper fuel tank (8).

W Install fuel tank breather hose assembly (5) and tighten two hose clamps (6).

X Install elbow (4) and adapter (3).

Y Install crossover hose assembly (2) and tighten swivel nuts (1).

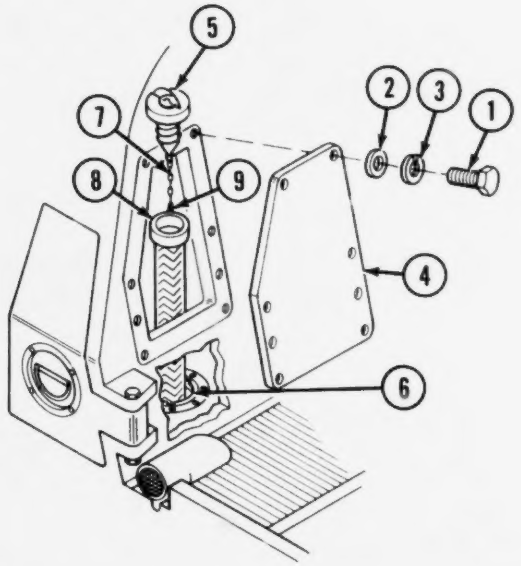
TA58027

FUEL FILL ACCESS PLATE, FUEL FILL CAP AND FUEL STRAINER: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Dry-cleaning solvent (item 19, Appx D)



REMOVAL

A Remove eight screws (1), eight flat washers (2) and eight lockwashers (3). Discard lockwashers.

B Remove access plate (4).

C Unscrew fill cap (5) from tank fill tube (6).

D Pull fill cap (5) and chain (7) straight up and out of access opening; grasp strainer assembly (8) and remove from vehicle.

E Remove fill cap (5) and chain (7) from strainer assembly (8) by releasing hook (9).

INSTALLATION

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

A Clean strainer assembly (8) mesh with dry-cleaning solvent (item 19, Appx D), or discard if strainer mesh is torn.

B Install fill cap (5) and chain (7) on strainer assembly (8) using hook (9).

C Install strainer assembly (8) in vehicle.

D Screw fill cap (5) into tank fill tube (6).

E Install access plate (4) using eight screws (1), eight flat washers (2) and eight new lockwashers (3).

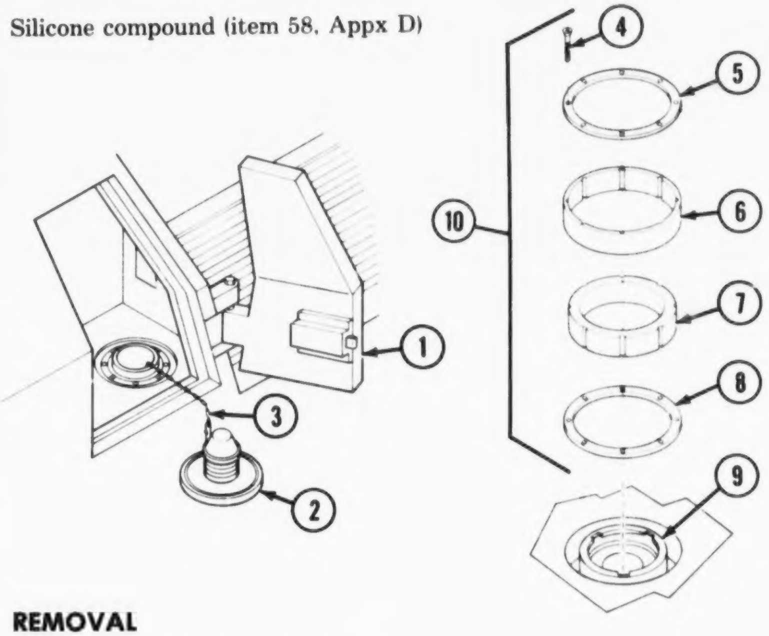
TA312728

FILLER NECK ASSEMBLY SEAL: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Silicone compound (item 58, Appx D)



REMOVAL

A Open fuel fill access door (1).

B Pull fuel fill cap (2) and chain (3) straight up and remove from strainer (hidden).

C Remove eight screws (4), top washer (5), outer seal (6), inner seal (7) and bottom washer (8) from around fuel fill neck (9).

INSTALLATION

NOTE

Seals are made eccentric so that they may be adjusted. Filler neck may not be centered in filler neck hole; adjust accordingly.

A Apply silicone compound (item 58, Appx D) to both seals.

B Place inner seal (7) inside outer seal (6). Turn seals to aline screw holes.

C Assemble top washer (5) on top, and position washer (8) with threaded holes on bottom.

D Insert eight screws (4) and turn three to four turns. Do not tighten screws.

NOTE

Tightening or loosening of screws may be required during seal assembly installation.

E Aline fuel fill neck (9) and seal assembly (10), and drive in assembly with hammer.

F After seal assembly (10) is installed, tighten eight screws (4).

G Connect chain hook (3) and fuel fill cap (2) to strainer (hidden).

H Screw fuel fill cap (2) into fuel fill neck (9).

I Close fuel fill access door (1).

TA312729

FILLER NECK: REMOVAL AND INSTALLATION

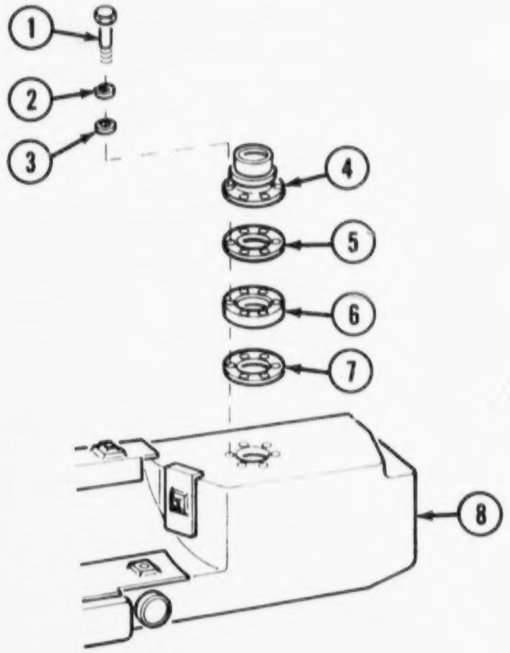
INITIAL SETUP

Materials/Parts:

Silicone compound (item 58, Appx D)

Equipment Condition:

Filler neck assembly removed (p 4-6).
Upper fuel tank drained (p 4-2).



REMOVAL

A Remove six screws (1), six lockwashers (2) and six flat washers (3). Discard lockwashers.

B Remove filler neck (4), gasket (5), spacer (6) and gasket (7) from upper fuel tank (8). Discard gaskets.

INSTALLATION

NOTE

Apply silicon compound (item 58, Appx D) to gasket surfaces before installation.

A Install new gasket (7), spacer (6), new gasket (5) and filler neck (4) in upper fuel tank (8).

B Install six screws (1), six new lockwashers (2) and six flat washers (3).

TA312730

FUEL TANK LEVEL TRANSMITTER (UPPER): REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

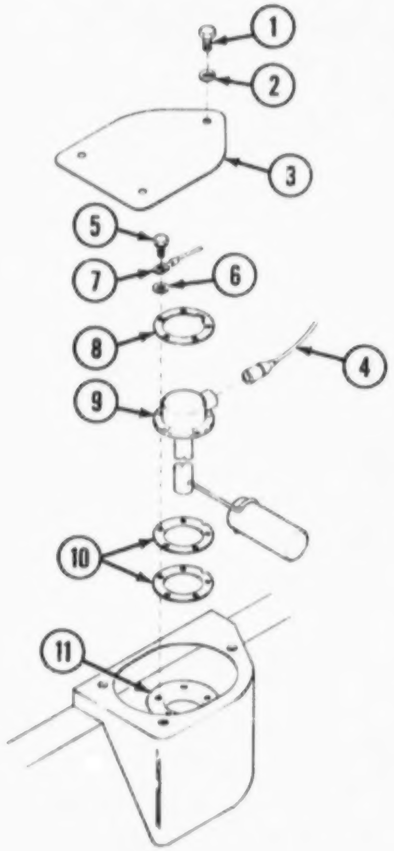
Sealing compound (item 54, Appx D)

Personnel Required:

Two

Equipment Condition:

Exhaust deflector removed (p 9-66.13).
Exhaust deck removed (p 9-66.12).



REMOVAL

NOTE

If upper fuel tank is full, drain enough fuel to make removal of transmitter possible.

A Remove three screws (1), three lockwashers (2) and cover (3). Discard lockwashers.

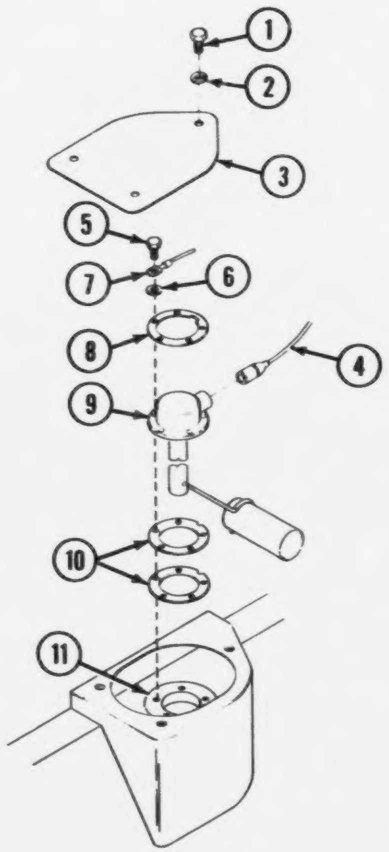
B Disconnect electrical connector (4).

C Remove five screws (5), five flat washers (6), ground lead (7) and spacer (8).

D Remove transmitter (9) and two gaskets (10) from fuel tank (11). Discard gaskets.

TA312731

FUEL TANK LEVEL TRANSMITTER (UPPER): REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTE

Apply sealing compound (item 54, Appx D) to gaskets before installation.

A Install two new gaskets (10) and transmitter (9) in fuel tank (11).

B Install spacer (8), ground lead (7), five screws (5) and five flat washers (6).

C Connect electrical connector (4).

D Install cover (3) with three screws (1) and three new lockwashers (2).

TA312852

FUEL TANK LEVEL TRANSMITTER (LOWER): REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

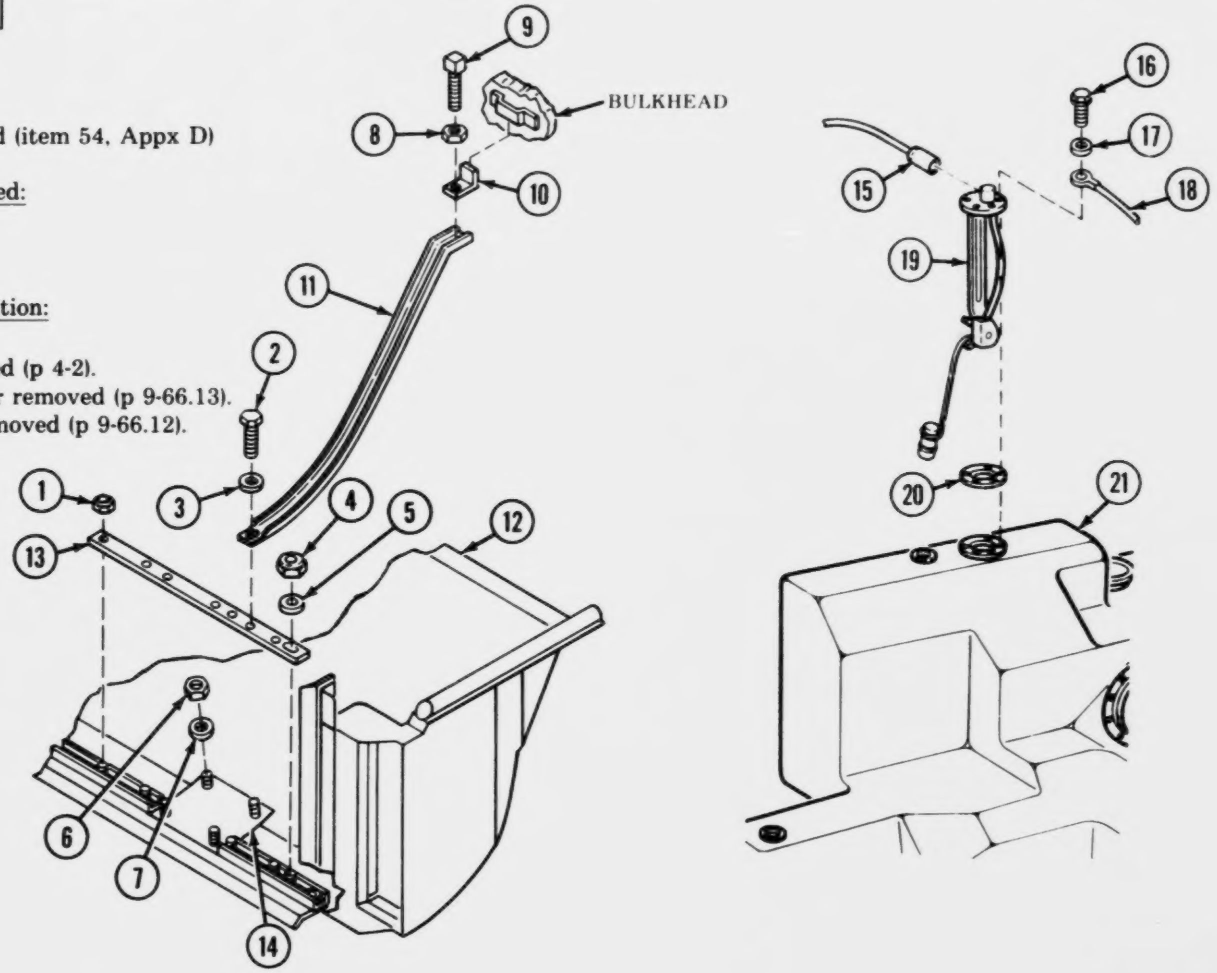
Sealing compound (item 54, Appx D)

Personnel Required:

Two

Equipment Condition:

Fuel tanks drained (p 4-2).
Exhaust deflector removed (p 9-66.13).
Exhaust deck removed (p 9-66.12).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TA312732

FUEL TANK LEVEL TRANSMITTER (LOWER): REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Remove six self-locking nuts (1), screw (2), and flat washer (3). Discard nuts.

B Remove nut (4) and flat washer (5).

C Remove two nuts (6) and two flat washers (7).

D Loosen locknut (8) and screw (9) enough to remove angle bracket (10) from bulkhead.

E Remove stiffener (11) from heat shield (12).

F Remove bar (13) and access cover (14).

G Disconnect electrical connector (15).

H Remove five screws (16), five flat washers (17) and ground lead (18).

I Remove transmitter (19) and gasket (20) from lower fuel tank (21). Discard gasket.

INSTALLATION

NOTE

Apply sealing compound (item 54, Appx D) to new gasket before installation.

A Install new gasket (20) and transmitter (19) in lower fuel tank (21).

B Install ground lead (18), five screws (16) and five flat washers (17).

C Connect electrical connector (15).

D Install access cover (14) and bar (13).

E Install stiffener (11) on heat shield (12).

F Install angle bracket (10) on bulkhead, and tighten screw (9) and locknut (8).

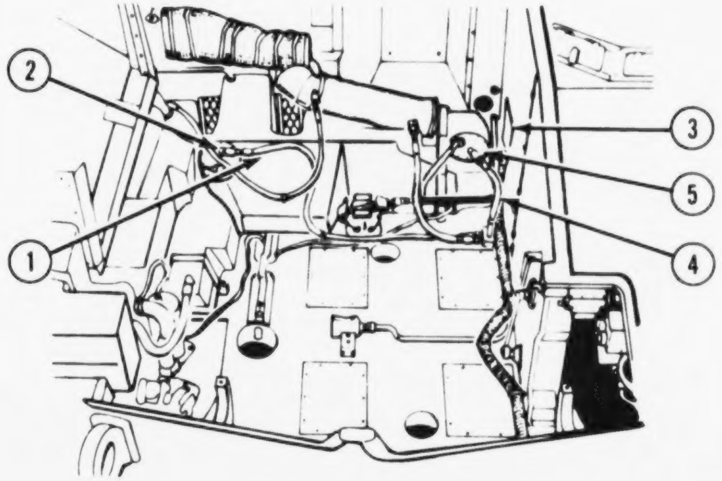
G Install two nuts (6) and two flat washers (7).

H Install nut (4) and flat washer (5).

I Install screw (2), flat washer (3) and six new self-locking nuts (1).

TA312733

FUEL CHECK VALVE (RIGHT AND LEFT): REMOVAL AND INSTALLATION



FUEL CHECK VALVE (RIGHT)

REMOVAL

A Remove powerpack (p 3-1).

B Drain fuel tanks (TM 9-2350-267-10).

C Disconnect fuel hose (1) at right check valve (2).

D Remove right check valve (2) from pump assembly.

FUEL CHECK VALVE (LEFT)

REMOVAL

NOTE

Powerpack does not have to be removed to remove left fuel check valve.

A Remove engine compartment access cover (3) (p 3-14).

B Drain fuel tanks (TM 9-2350-267-10).

C Remove fuel hose (4) at left check valve (5).

D Remove check valve (5) from pump assembly.

INSTALLATION

Reverse removal procedures for both right and left fuel check valves.

TA310067

LEFT ELECTRIC FUEL PUMP: REMOVAL AND INSTALLATION

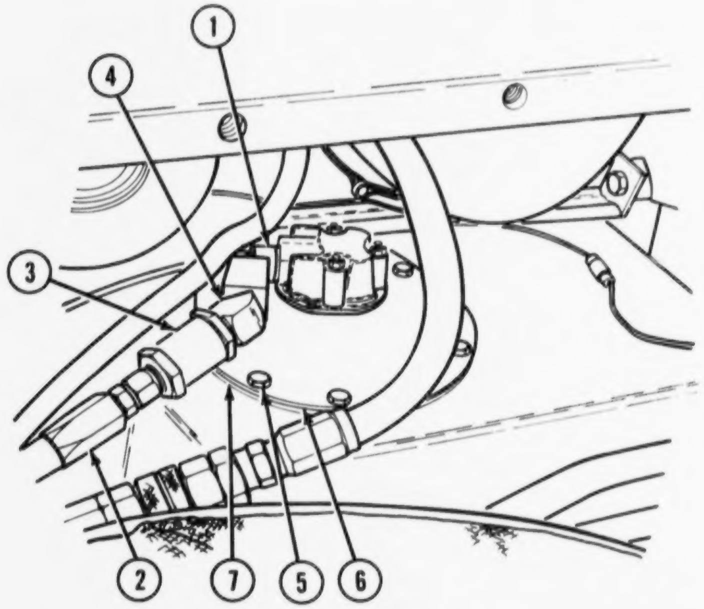
INITIAL SETUP

Materials/Parts:

Sealing compound, Teflon (item 57, Appx D)

Equipment Condition:

Fuel tanks drained (p 4-2).
Engine compartment access cover removed (p 9-25).



REMOVAL

A Disconnect electrical connector (1).

B Remove fuel hose (2), check valve (3) and elbow (4).

C Remove 10 screws (5), fuel pump assembly (6) and gasket (7). Discard gasket.

INSTALLATION

NOTE

Apply Teflon sealing compound (item 57, Appx D) to gasket before installation.

A Install new gasket (7) and fuel pump assembly (6) and secure with 10 screws (5).

B Install elbow (4), check valve (3) and fuel hose (2).

C Connect electrical connector (1).

TA312734

RIGHT ELECTRIC FUEL PUMP: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

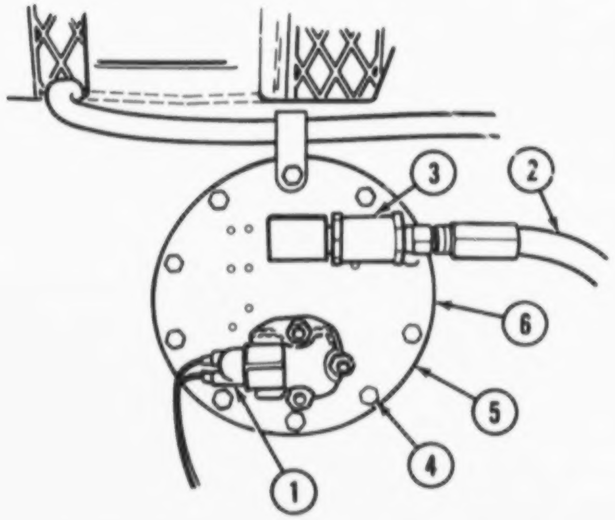
Wrench, open-end 3/16-in. (item 79, Appx B)

Materials/Parts:

Sealing compound, Teflon (item 57, Appx D)

Equipment Condition:

Fuel tanks drained (p 4-2).
Powerpack removed (p 3-1).



REMOVAL

A Disconnect electrical connector (1).

B Disconnect fuel hose (2) and remove check valve (3).

C Remove 10 screws (4), fuel pump assembly (5) and gasket (6). Discard gasket.

INSTALLATION

A Apply Teflon sealing compound (item 57, Appx D) to new gasket (6).

B Install new gasket (6) and fuel pump assembly (5) and secure with 10 screws (4).

C Install check valve (3) and connect fuel hose (2).

D Connect electrical connector (1).

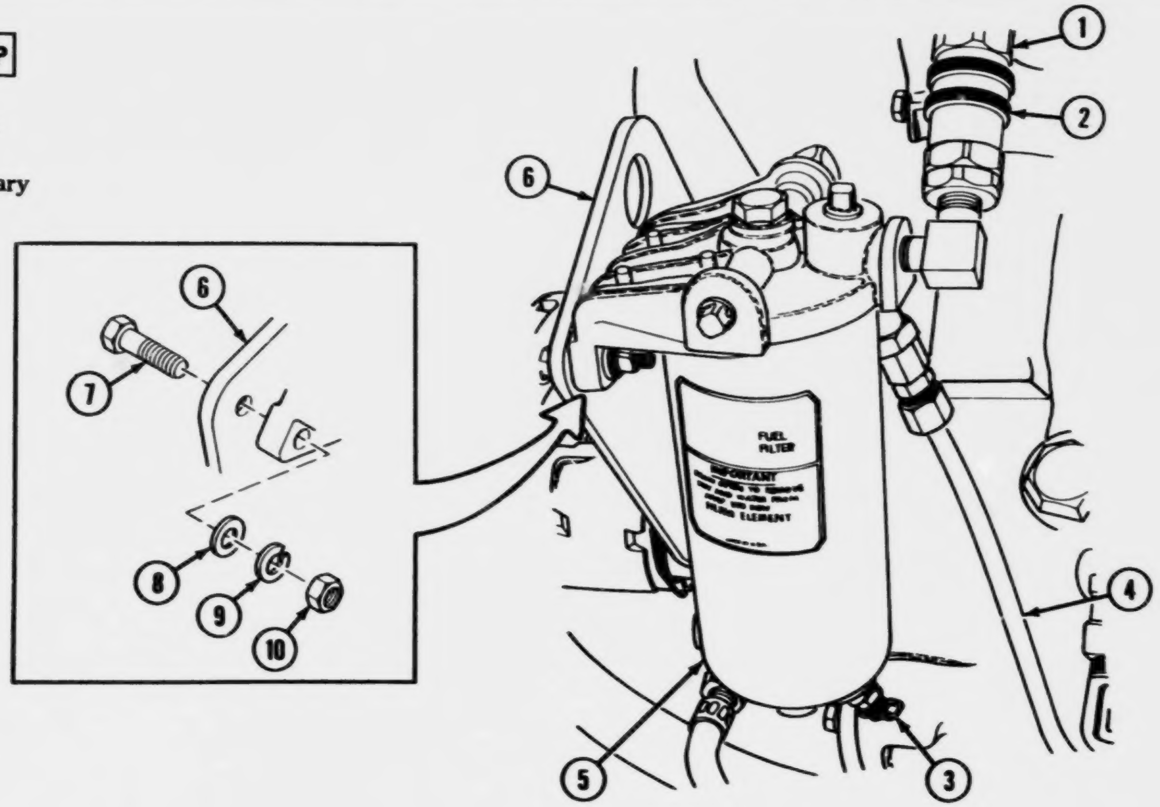
TA57127

FUEL FILTER ASSEMBLY (PRIMARY): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Parts/Materials:

Fuel filter, primary



REMOVAL

A Open right transmission access door.

B Disconnect main fuel hose (1) at quick-disconnect (2).

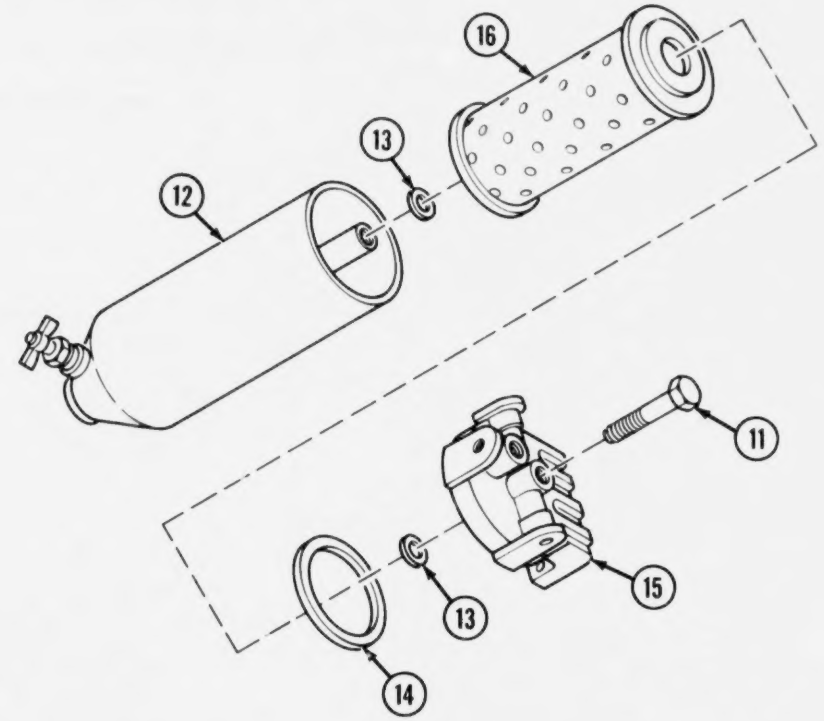
C Open drain cock (3) and drain fuel from filter.

D Disconnect primary filter-to-engine driven fuel pump hose (4).

E Remove filter assembly (5) from bracket (6) by removing two screws (7), two flat washers (8), two lockwashers (9) and two nuts (10). Discard lockwashers.

TA312736

FUEL FILTER ASSEMBLY (PRIMARY): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Loosen cover screw (11).

B Remove filter shell (12), two washers (13) and gasket (14) from filter cover (15). Discard gasket.

C Remove and discard filter element (16).

ASSEMBLY

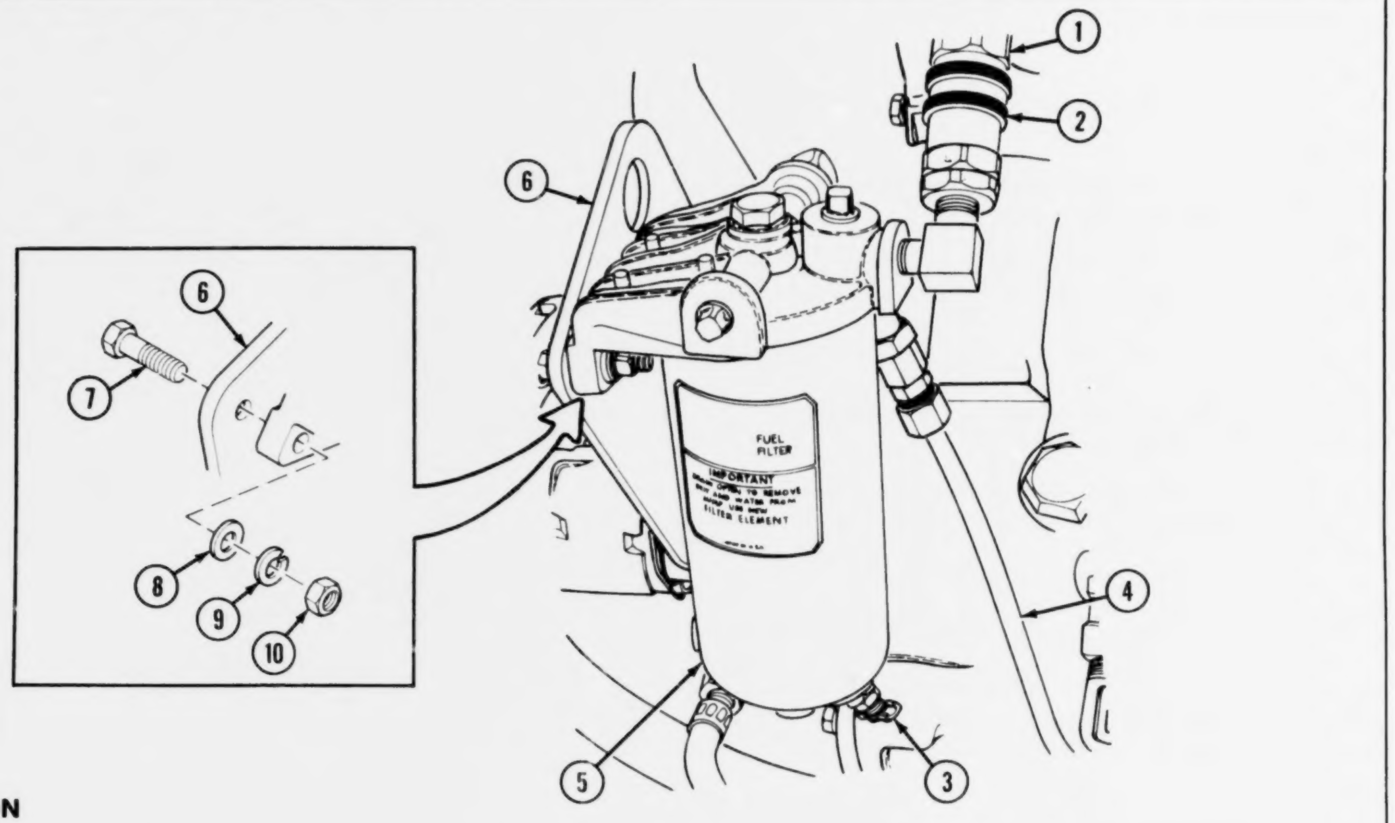
A Install new filter element (16) in filter shell (12).

B Install new gasket (14), two washers (13) and filter shell (12) on filter cover (15).

C Tighten cover screw (11).

TA312737

FUEL FILTER ASSEMBLY (PRIMARY): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Install filter assembly (5) on bracket (6) with two screws (7), two flat washers (8), two new lockwashers (9) and two nuts (10).

B Connect primary filter-to-engine driven fuel pump hose (4).

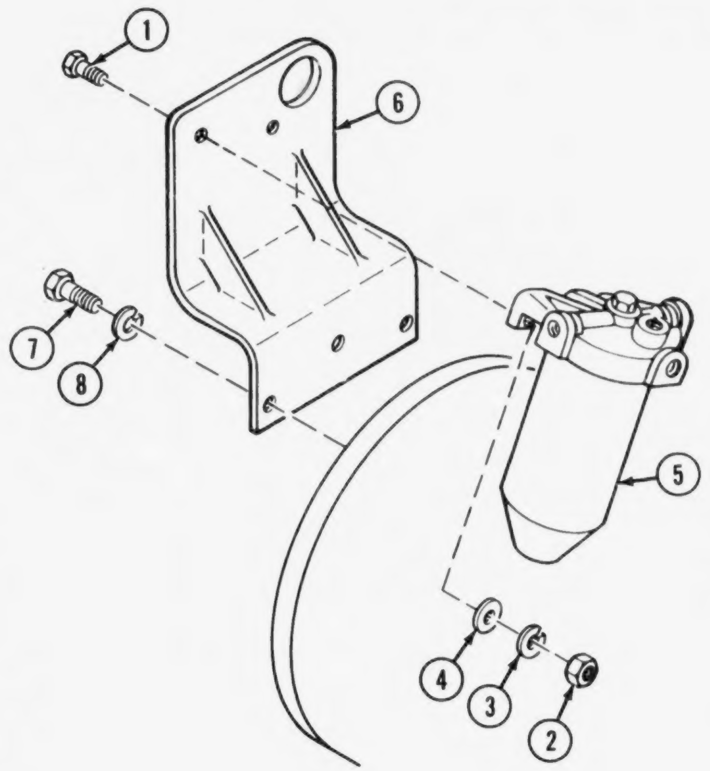
C Close drain cock (3).

D Connect main fuel hose (1) at quick-disconnect (2).

E Close right transmission access door.

TA312738

PRIMARY FUEL FILTER LIFTING BRACKET: REMOVAL AND INSTALLATION



REMOVAL

A Open and secure both transmission access doors.

NOTE

It is not necessary to disconnect fuel lines or drain fuel filter.

B Remove two screws (1), two nuts (2), two lockwashers (3) and two flat washers (4) that secure primary fuel filter (5) to bracket assembly (6). Discard lockwashers.

C Pull fuel filter (5) away from bracket assembly (6).

NOTE

Three screws (7) are of different lengths. Mark upon removal to ensure proper installation.

D Remove three screws (7) and three lockwashers (8) and remove bracket assembly (6) from transmission. Discard lockwashers.

INSTALLATION

A Install bracket assembly (6) on transmission with three screws (7) and three new lockwashers (8).

B Secure primary fuel filter (5) to bracket assembly (6) with two screws (1), two new lockwashers (3), two flat washers (4) and two nuts (2).

C Close and secure both transmission access doors.

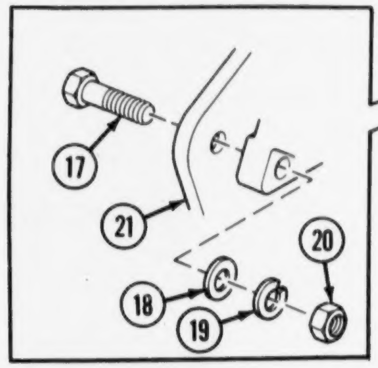
TA312739

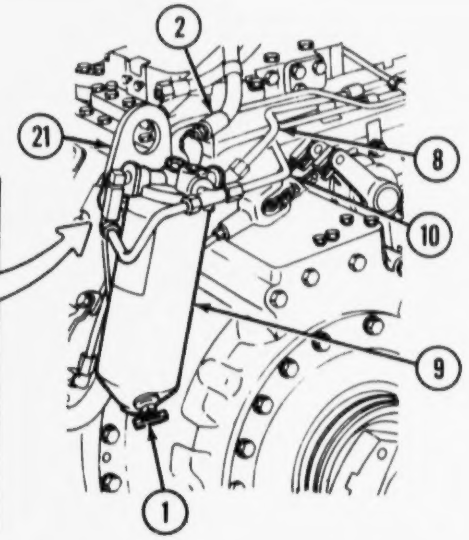
FUEL FILTER ASSEMBLY (SECONDARY): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

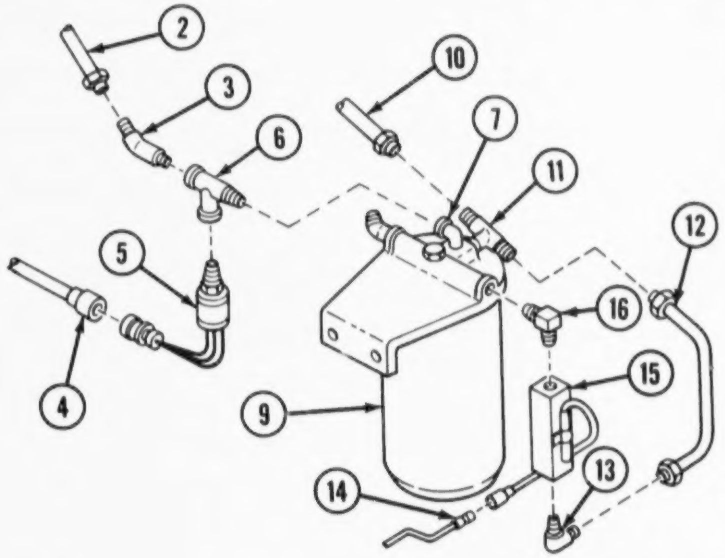
INITIAL SETUP

Materials/Parts:

Fuel filter, secondary







REMOVAL

A Open transmission access doors.

B Open drain cock (1) and drain fuel from filter.

C Disconnect electric fuel pump-to-secondary fuel filter hose (2) at elbow (3).

D Remove electrical connector (4) from transducer (5).

E Remove transducer (5) from tee (6).

F Remove elbow (3) and tee (6) from elbow (7).

G Disconnect secondary fuel filter-to-cylinder head tube (8) from fuel filter assembly (9).

H Disconnect engine driven fuel pump-to-secondary fuel filter tube (10) from tee (11).

I Remove tube (12) from elbow (13) and tee (11).

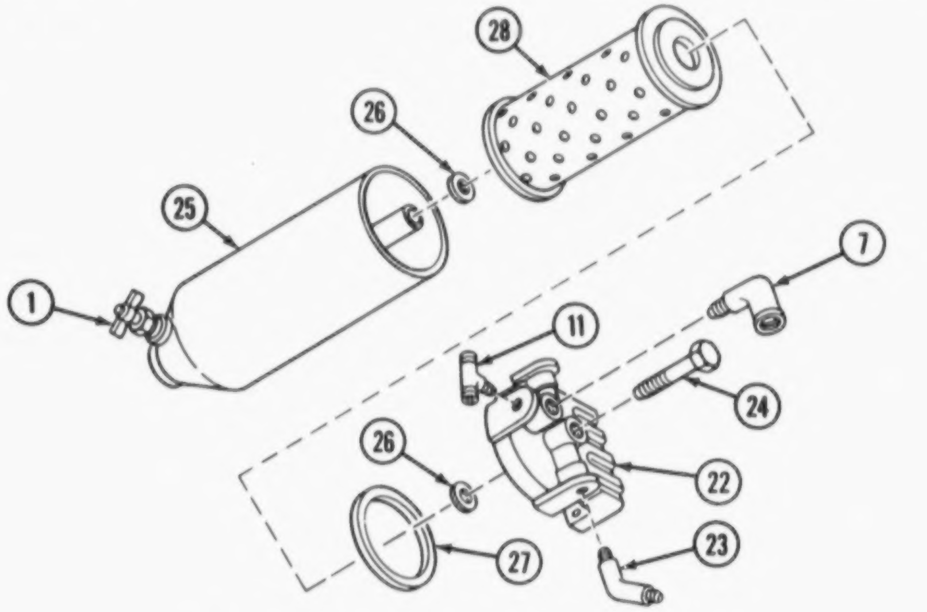
J Disconnect electrical connector (14) from transducer (15).

K Remove elbow (13), transducer (15) and elbow (16) from fuel filter assembly (9).

L Remove two screws (17), two flat washers (18), two lockwashers (19), two nuts (20) and secondary fuel filter assembly (9) from bracket (21). Discard lockwashers.

TA57128

FUEL FILTER ASSEMBLY (SECONDARY): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

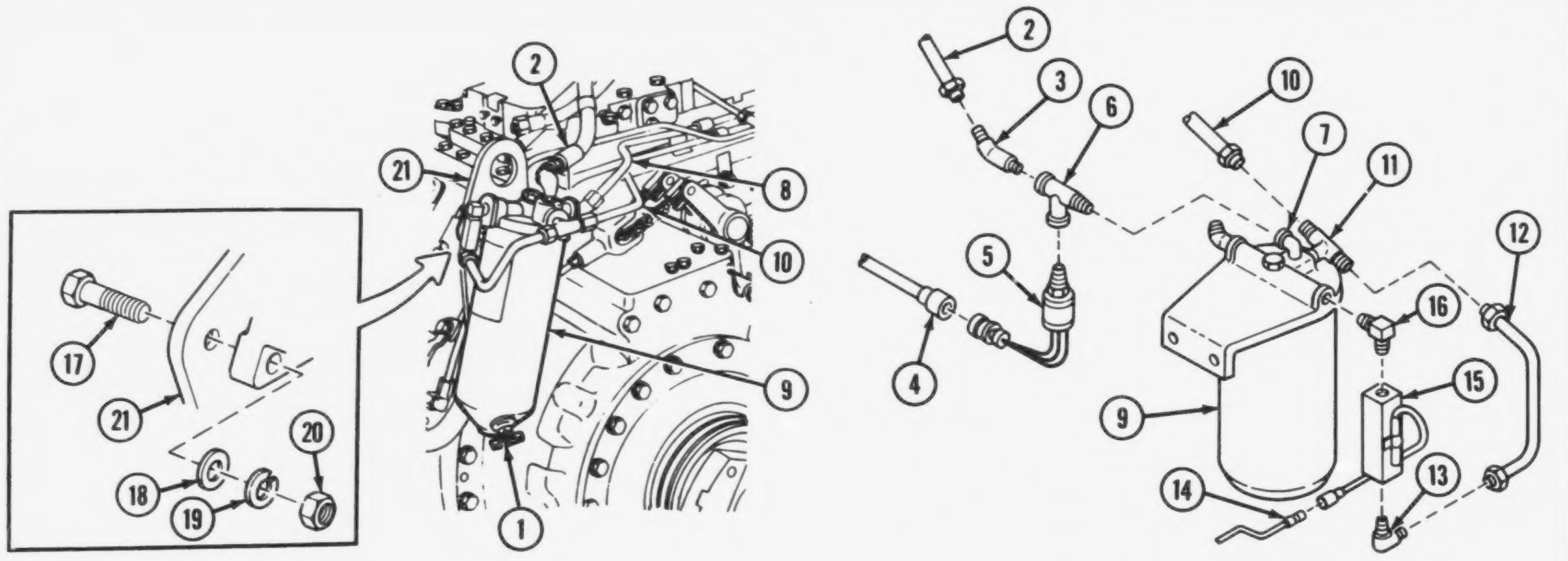
- A Remove drain cock (1).
- B Remove elbow (7) and tee (11) from filter cover (22).
- C Remove elbow (23) from filter cover (22).
- D Remove cover screw (24).
- E Remove filter shell (25), two washers (26) and gasket (27) from filter cover (22). Discard gasket.
- F Remove and discard filter element (28).

ASSEMBLY

- A Install new filter element (28) in filter shell (25).
- B Install new gasket (27), two washers (26) and filter shell (25) on filter cover (22).
- C Install cover screw (24).
- D Install elbow (7) and tee (11) on filter cover (22).
- E Install elbow (23) on filter cover (22).
- F Install and close drain cock (1).

TA57129

FUEL FILTER ASSEMBLY (SECONDARY): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Install secondary fuel filter assembly (9) on bracket (21) with two screws (17), two flat washers (18), two new lockwashers (19) and two nuts (20).

B Install elbow (16), transducer (15) and elbow (13) on filter assembly (9).

C Install tube (12) on elbow (13) and tee (11).

D Connect engine driven fuel pump-to-secondary fuel filter tube (10) to tee (11).

E Connect secondary fuel filter-to-cylinder head tube (8) to fuel filter (9).

F Install tee (6) and elbow (3) on elbow (7).

G Install transducer (5) on tee (6).

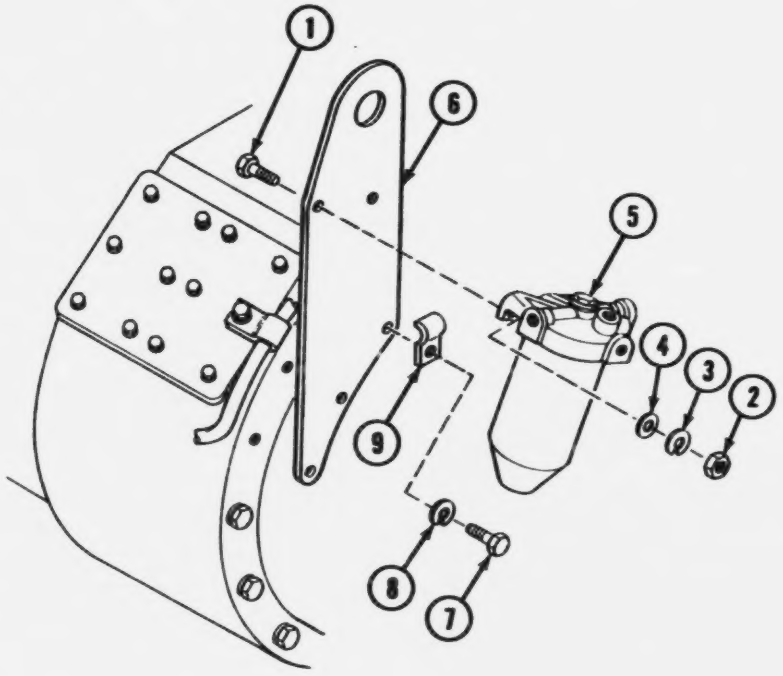
H Connect electric fuel pump-to-secondary fuel filter hose (2) at elbow (3).

I Connect electrical connector (14) to transducer (15) and electrical connector (4) to transducer (5).

J Close transmission access doors.

TA57130

SECONDARY FUEL FILTER LIFTING BRACKET: REMOVAL AND INSTALLATION



REMOVAL

A Open and secure both transmission access doors.

NOTE

It is not necessary to disconnect fuel lines or drain fuel filter.

B Remove two screws (1), two nuts (2), two lockwashers (3) and two flat washers (4) that secure secondary fuel filter (5) to lifting bracket (6). Discard lockwashers.

C Remove three screws (7), three lockwashers (8) and surge tank tube retaining strap (9) and remove lifting bracket (6) from transmission. Discard lockwashers.

INSTALLATION

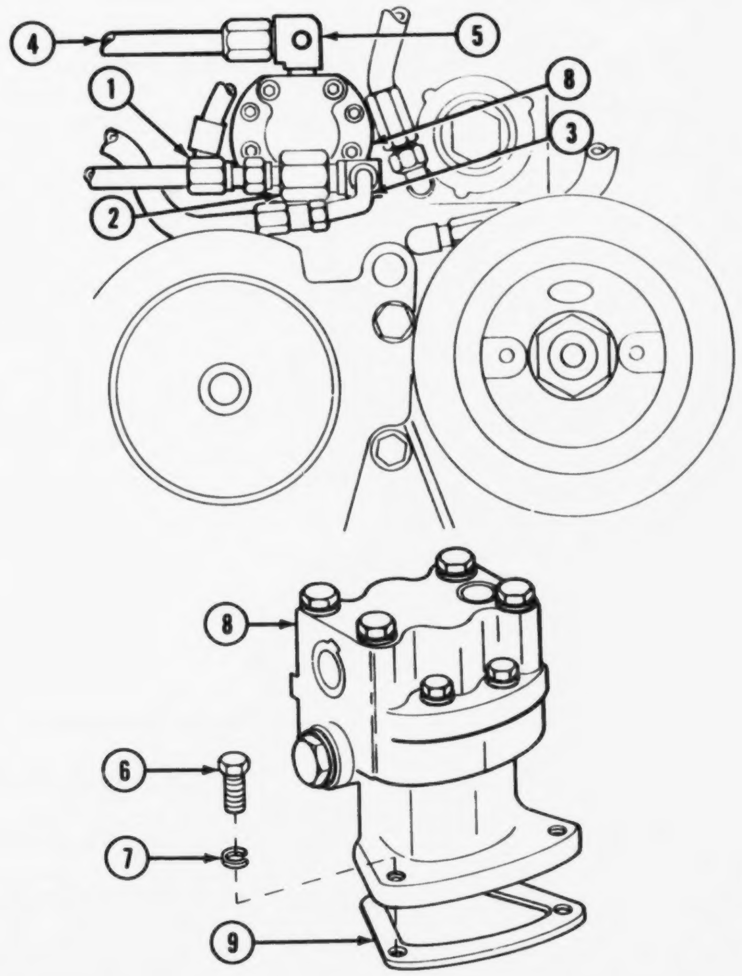
A Install lifting bracket (6) and surge tank retaining strap (9) on transmission with three screws (7) and three new lockwashers (8).

B Secure secondary fuel filter (5) to fuel filter lifting bracket (6) with two screws (1), two flat washers (4), two new lockwashers (3) and two nuts (2).

C Close and secure both transmission access doors.

TA57131

ENGINE DRIVEN FUEL PUMP: REMOVAL AND INSTALLATION



REMOVAL

A Open air intake grille and secure in position (p 3-5).

B Remove exhaust grille, radiator fan access door and front slope plate (p 3-6 thru p 3-8).

C Remove exhaust crossover tube (p 4-32).

D Disconnect primary filter-to-engine driven fuel pump tube (1) at tee (2).

E Disconnect engine driven fuel pump-to-electric fuel pump hose (3) at tee (2).

F Disconnect engine driven fuel pump-to-secondary filter tube (4) at elbow (5).

G Remove three screws (6) and three lockwashers (7).

H Remove fuel pump (8) and gasket (9). Discard gasket (9).

INSTALLATION

A Reverse removal procedure.

B Install new gasket (9).

TA310073

ELECTRIC FUEL PUMP: REMOVAL AND INSTALLATION

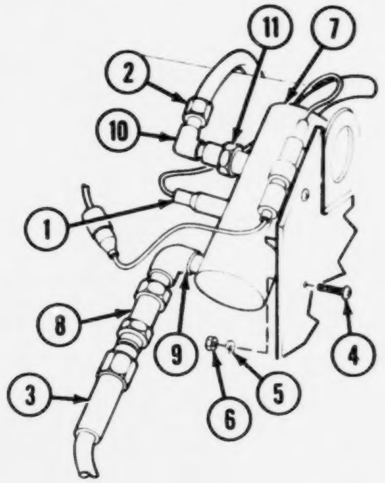
INITIAL SETUP

Materials/Parts:

Tape, Teflon (item 62, Appx D)

Equipment Condition:

Front slope plate removed (p 3-5).



REMOVAL

A Disconnect electrical connector (1).

B Disconnect engine driven fuel pump-to-electrical fuel pump hose (2).

C Disconnect electric fuel pump-to-secondary filter hose (3).

D Remove two screws (4), two lockwashers (5) and two nuts (6). Discard lockwashers.

E Remove electric fuel pump (7).

F Remove assembled check valve (8) and elbow (9) from electric fuel pump (7).

G Remove assembled elbow (10) and adapter (11) from electric fuel pump (7).

INSTALLATION

NOTE

Use Teflon tape (item 62, Appx D) on all male pipe threads during installation.

A Install assembled adapter (11) and elbow (10) on electric fuel pump (7).

B Install assembled elbow (9) and check valve (8) on electric fuel pump (7).

C Install electric fuel pump (7) with two screws (4), two new lockwashers (5) and two nuts (6).

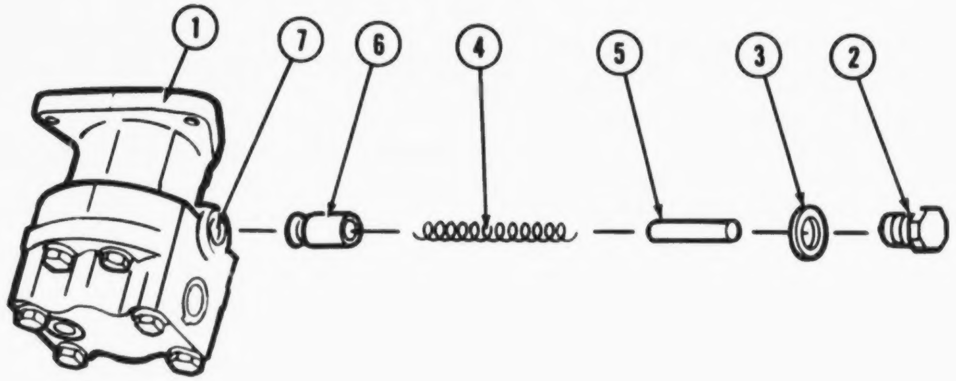
D Connect electric fuel pump-to-secondary fuel hose (3).

E Connect engine driven fuel pump-to-electrical fuel pump hose (2).

F Connect electrical connector (1).

TA312746

RELIEF VALVE: CHECKING AND CLEANING



CHECKING

A Remove engine driven fuel pump (1) (p 4-15).

B Remove plug (2) and gasket (3).

C Remove spring (4), pin (5) and valve (6). Wash with solvent (item 19, Appx D).

D Discard gasket (3).

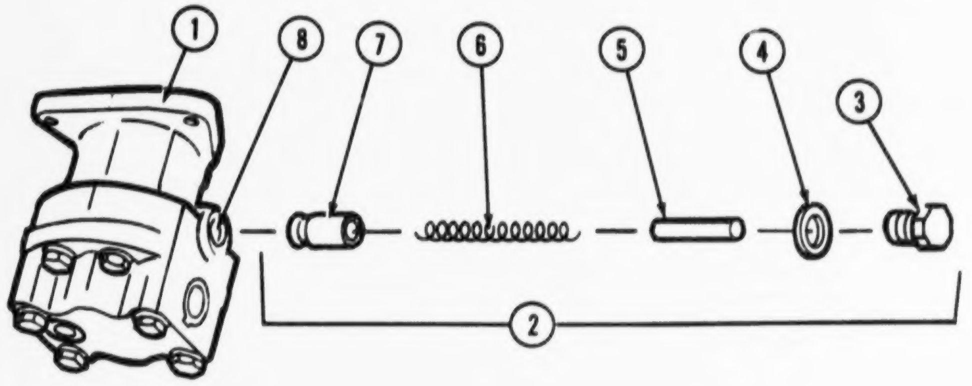
E Blow out fuel pump cavity port (7) with compressed air.

F Install valve (6), pin (5), spring (4), new gasket (3) and plug (2) in fuel pump (1).

G Install engine driven fuel pump (1) (p 4-15).

TA310075

RELIEF VALVE: CHECKING AND CLEANING (CONTINUED)



CLEANING

A Remove engine fuel pump (p 4-15).

B Disassemble check relief valve assembly (2) (p 4-17) Discard gasket (4).

C Wash check relief valve assembly components, items 3 through 7, with solvent (item 19, Appx D).

D Blow out check relief valve cavity port (8) with compressed air.

E Reassemble check relief valve assembly (2). Install new gasket (4).

F Install in engine driven fuel pump (1).

G Test for fuel flow - 1/2 gallon per minute. If flow is less than 1/2 gallon per minute, replace pump.

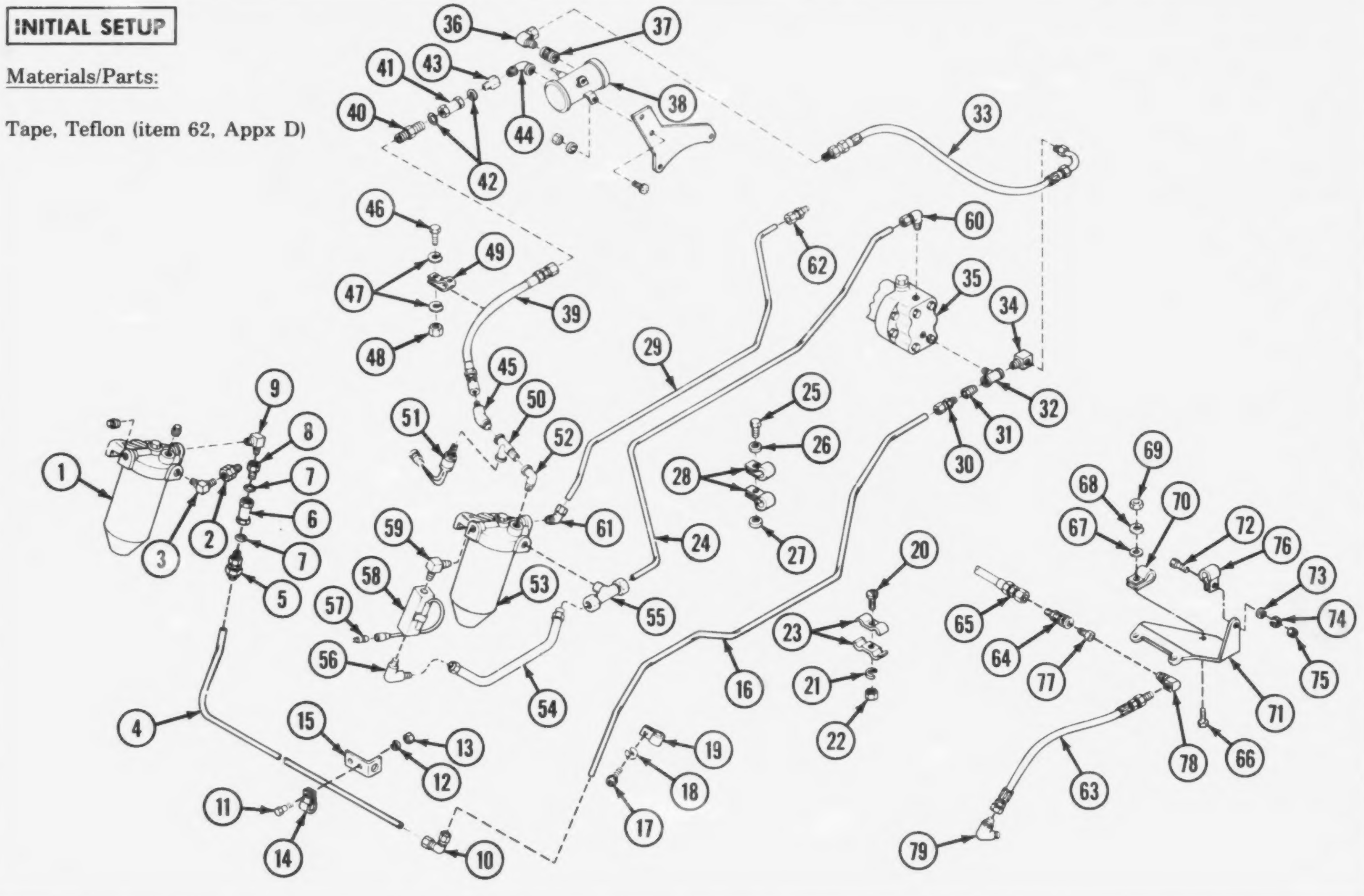
TA310076

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Tape, Teflon (item 62, Appx D)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TA58057

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTES

- Restrict removal to only those fuel system hoses, tubes, and connectors which must be replaced.
- Removal of certain components will require removal of the front slope plate (p 3-8).

A At primary fuel filter (1) input, disconnect quick-disconnect coupling (2).

B Remove quick-disconnect coupling half (2) from elbow (3).

C Remove elbow (3) from filter (1) input.

D Disconnect tube (4) from nipple (5).

E Remove nipple (5), check valve (6), two preformed packings (7), adapter (8), and elbow (9) from primary fuel filter (1) output. Discard preformed packings.

F Disconnect tube (4) from elbow (10).

G Remove screw (11), lockwasher (12), nut (13), and loop clamp (14) from angle bracket (15). Remove tube (4). Discard lockwasher.

H Remove elbow (10) from tube (to engine driven fuel pump) (16).

I Remove screw (17), lockwasher (18), and loop clamp (19) securing tube (16) to engine. Discard lockwasher.

J Remove two screws (20), two lockwashers (21), two nuts (22), and four straps (23) securing tubes (16 and 24). Discard lockwashers.

K Remove three screws (25), three lockwashers (26), three flat washers (27), and six loop clamps (28) securing tubes (24 and 29) to transmission. Discard lockwashers.

L Disconnect adapter (30) from bushing (31). Remove tube (16).

M Remove bushing (31) from tee (32).

N Disconnect hose (33) from elbow (34).

O Remove elbow (34) and tee (32) from engine driven fuel pump (35).

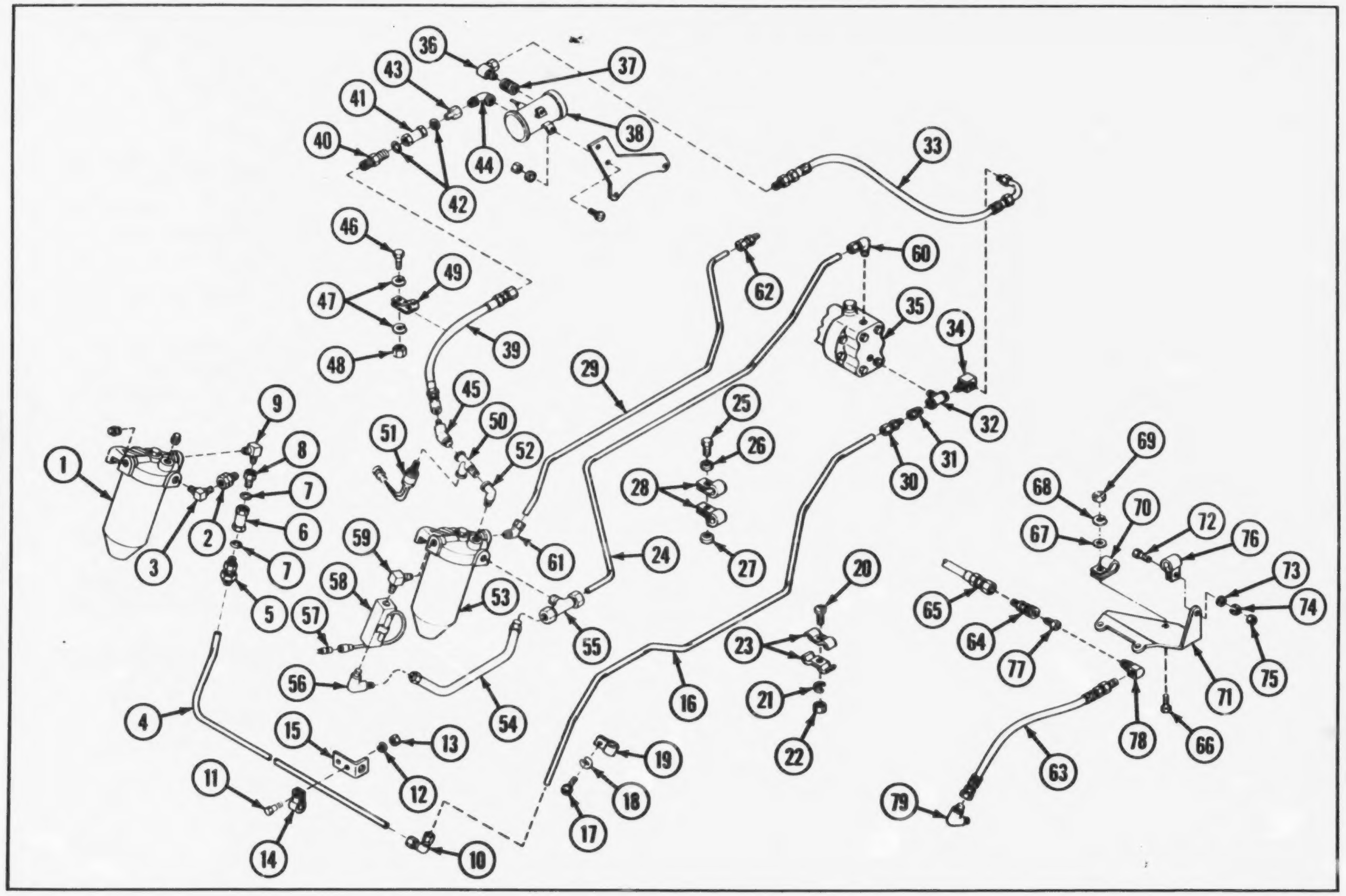
P Remove hose (33) from elbow (36).

Q Remove elbow (36) from coupling (37).

R Remove coupling (37) from electric fuel pump (38) input.

TA58047

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)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TA58037

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)

S Disconnect hose (39) from nipple (40).

T Remove nipple (40), check valve (41), two preformed packings (42), adapter (43) and elbow (44) from electric fuel pump (38) output. Discard preformed packings.

U Disconnect hose (39) from elbow (45).

V Remove screw (46) two lockwashers (47), nut (48), loop clamp (49) and hose (39). Discard lockwashers.

W Remove elbow (45) from tee (50).

X Disconnect wires from STE/ICE transducer (51).

Y Disconnect the STE/ICE transducer (51) from tee (50).

Z Remove tee (50) from elbow (52).

AA Remove elbow (52) from top of secondary fuel filter (53).

AB Disconnect tube (54) from tee (55) and elbow (56). Remove tube.

AC Disconnect wire (57) from transducer (58).

AD Remove elbow (56) from transducer (58).

AE Remove transducer (58) from elbow (59).

AF Remove elbow (59) from secondary fuel filter (53).

AG Disconnect tube (24) from tee (55) and elbow (60). Remove tube.

AH Remove tee (55) from secondary fuel filter (53).

AI Remove elbow (60) from engine driven fuel pump (35).

AJ Disconnect tube (25) from elbow (61) and adapter (62). Remove tube.

AK Remove elbow (61) from secondary fuel filter (53) output.

AL Disconnect vehicle fuel return line (63) at quick-disconnect coupling assembly (64) located at thermostat housing (65).

AM Remove screw (66), flat washer (67), lockwasher (68), nut (69), and loop clamp (70) from bracket (71). Discard lockwasher.

AN Remove screw (72), flat washer (73), lockwasher (74), nut (75), and loop clamp (76) from bracket (71). Discard lockwasher.

AO Remove quick-disconnect coupling (64), bushing (77), and elbow (78) from hose (63).

AP Disconnect other end of hose (63) from elbow (79). Remove hose.

INSTALLATION

NOTE

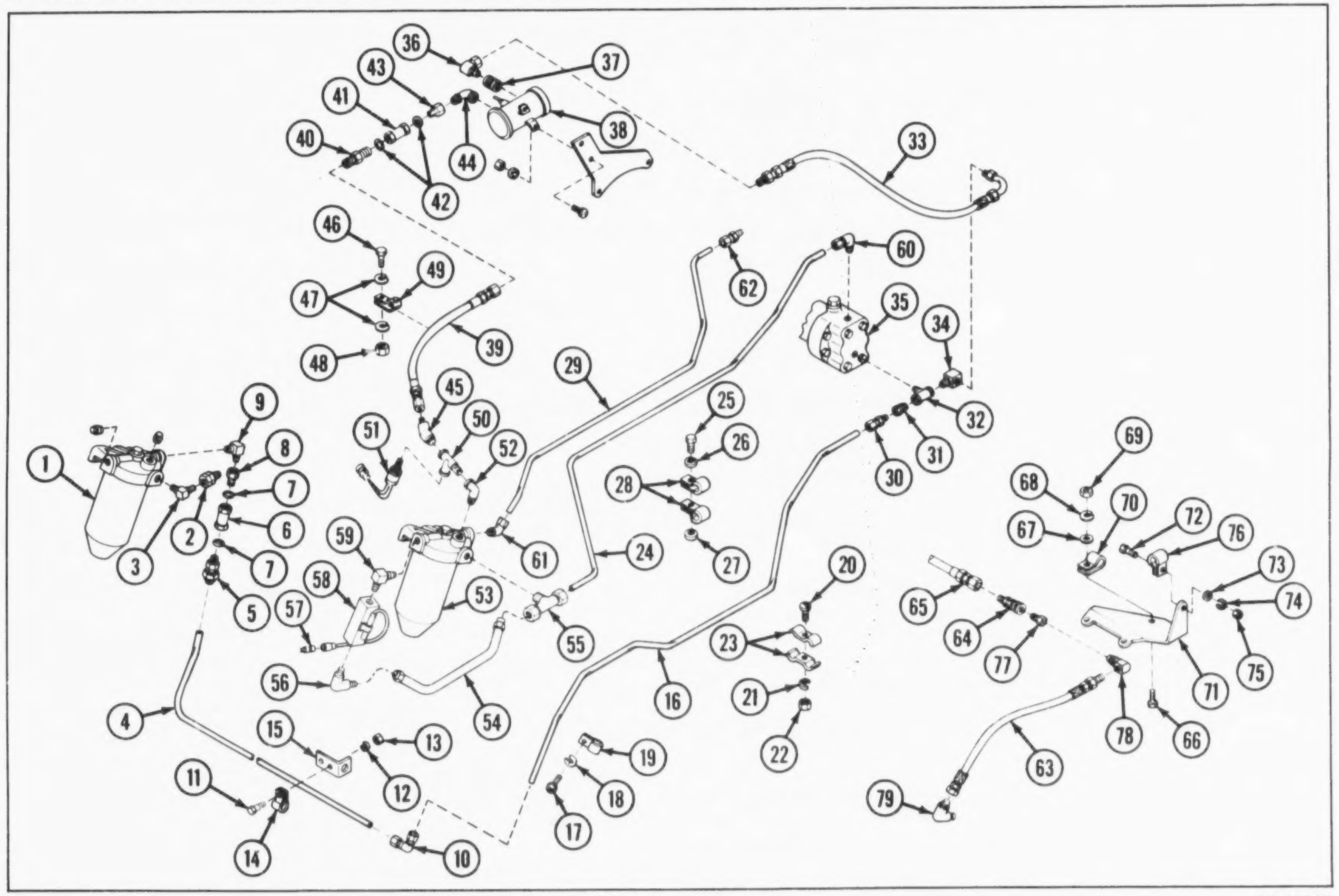
Apply Teflon tape (item 62, Appx D) to all male pipe threads during installation.

A Connect one end of hose (63) to elbow (79) located near rear of blower assembly.

B Install elbow (78), bushing (77), and quick-disconnect coupling half (64) on free end of hose (63).

TA58017 ■

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)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POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)

C Clamp end of hose (63) to bracket (71) using screw (72), flat washer (73), new lockwasher (74), nut (75), and loop clamp (76).

D Clamp quick-disconnect coupling half (64) and bushing (77) to bracket (71) using screw (66), flat washer (67), new lockwasher (68), nut (69), and loop clamp (70).

E Connect vehicle fuel return line (63) to quick-disconnect coupling half (64).

F Install elbow (61) on secondary fuel filter (53) output.

G Connect tube (25) to adapter (62) and elbow (61).

H Install elbow (60) on engine driven fuel pump (35).

I Install tee (55) on secondary fuel filter (53).

J Connect tube (24) to elbow (60) and tee (55).

K Install elbow (59) in secondary fuel filter (53).

L Install transducer (58) on elbow (59).

M Install elbow (56) on transducer (58).

N Connect wire (57) to transducer (58).

O Connect tube (54) to tee (55) and elbow (56).

P Install elbow (52) on top of secondary fuel filter (53).

Q Install tee (50) on elbow (52).

R Connect the STE/ICE transducer (51) to tee (50).

S Connect wires to STE/ICE transducer (51).

T Install elbow (45) on tee (50).

U Connect hose (39) to elbow (45).

V Install elbow (44), adapter (43), two new preformed packings (42), check valve (41) and nipple (40) on electric fuel pump (38) output.

W Connect free end of hose (39) to nipple (40).

X Secure hose (39) to engine using screw (46), two new lockwashers (47), loop clamp (49) and nut (48).

Y Install coupling (37) on electric fuel pump (38) input.

Z Install elbow (36) on coupling (37).

AA Connect hose (33) to elbow (36).

AB Install tee (32) and elbow (34) on engine driven fuel pump (35) input.

AC Connect free end of hose (33) to elbow (34).

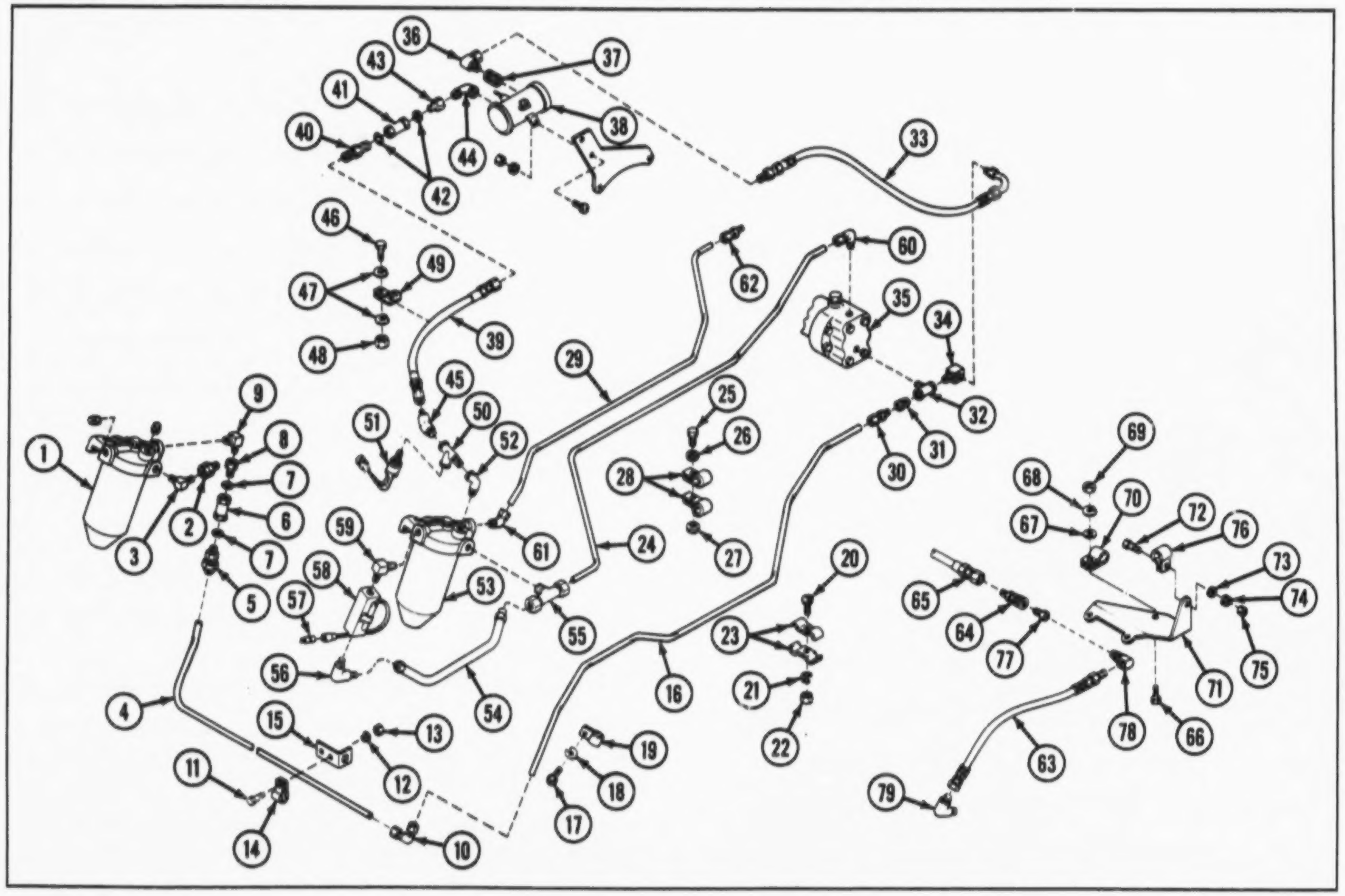
AD Install bushing (31) on tee (32).

AE Connect the adapter (30) end of tube (16) to bushing (31).

AF Connect free end of tube (16) to elbow (10).

TA58086

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)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TA58076

POWERPACK FUEL HOSES, TUBES AND CONNECTORS: REMOVAL AND INSTALLATION (CONTINUED)

AG Secure two tubes (24 and 29) to transmission using three screws (25), three new lockwashers (26), three flat washers (27), and six loop clamps (28). Tube (29) must be to right of tube (24).

AH Secure two tubes (16 and 24) using two screws (20), two new lockwashers (21), two nuts (22), and four straps (23). Tube (16) must be above tube (24).

AI Secure tube (16) to engine using screw (17), new lockwasher (18), and loop clamp (19).

AJ Connect tube (4) to elbow (10).

AK Install elbow (9), adapter (8), check valve (6), two new preformed packings (7), and nipple (5) on primary fuel filter (1) output.

AL Connect free end of tube (4) to nipple (5).

AM Secure tube (4) to angle bracket (15) using screw (11), new lockwasher (12), nut (13) and loop clamp (14).

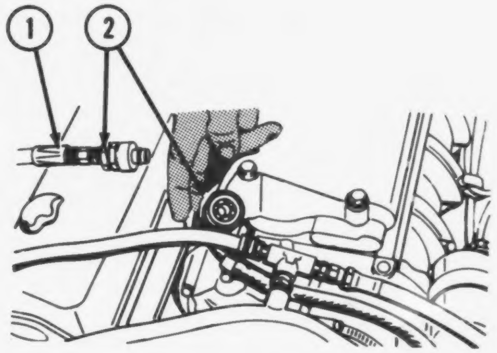
AN Install elbow (3) on primary fuel filter (1) input.

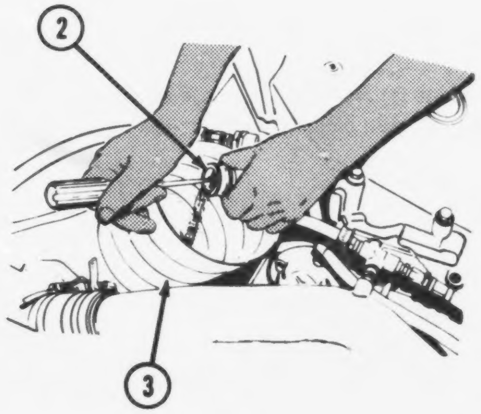
AO Install quick-disconnect coupling half (2) on elbow (3).

AP Connect fuel line to quick-disconnect coupling half (2).

TA57614

FUEL FLOW TEST





TEST

A Check that main fuel hose quick-disconnect is fully seated (p 4-20).

B Install new fuel filter(s) (p 4-12 and 4-14).

C Open air intake grille and secure (p 3-5).

D Warm up engine to 170°F (TM 9-2350-267-10).

E Disconnect fuel return hose (1).

CAUTION

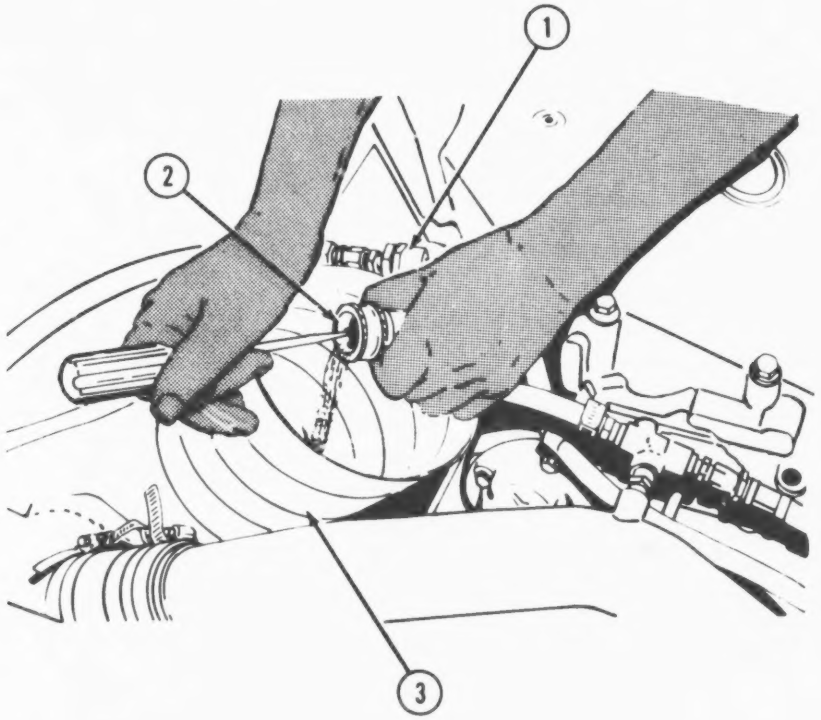
Ensure valve in quick-disconnect is pushed all the way in during the test.

F Place female half of quick-disconnect (2) over suitable container (3) to catch fuel.

G Set engine at 1200 rpm.

TA310080

FUEL FLOW TEST (CONTINUED)



H Depress female half of quick-disconnect (2) for one minute. Measure fuel in container (3).

I If fuel flow is less than 1/2 gallon per minute, replace engine driven fuel pump (p 4-16).

J Reconnect fuel return hose (1) at quick-disconnect (2).

TA310081

Section II AIR INTAKE SYSTEM

GENERAL

This section contains instructions on how to remove, disassemble, assemble and install the air intake system. The air intake system consists of the following:

- Air Cleaner
- Air Filter
- Ducts and Hoses

The maintenance procedures are given under the following headings:

- Air Cleaner Removal (p 4-25)
- Air Filter Removal (p 4-28)
- Ducts and Hoses Removal (p 4-29)

AIR CLEANER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

INITIAL SETUP

Materials/Parts:

Adhesive (item 4, Appx D)
2 x 4 x 18 in. wooden supports

Personnel Required:

Two

Equipment Condition:

Right projectile rack moved to rear of vehicle (TM 9-2350-267-10).
Air cleaner filters removed (p 4-28).

REMOVAL

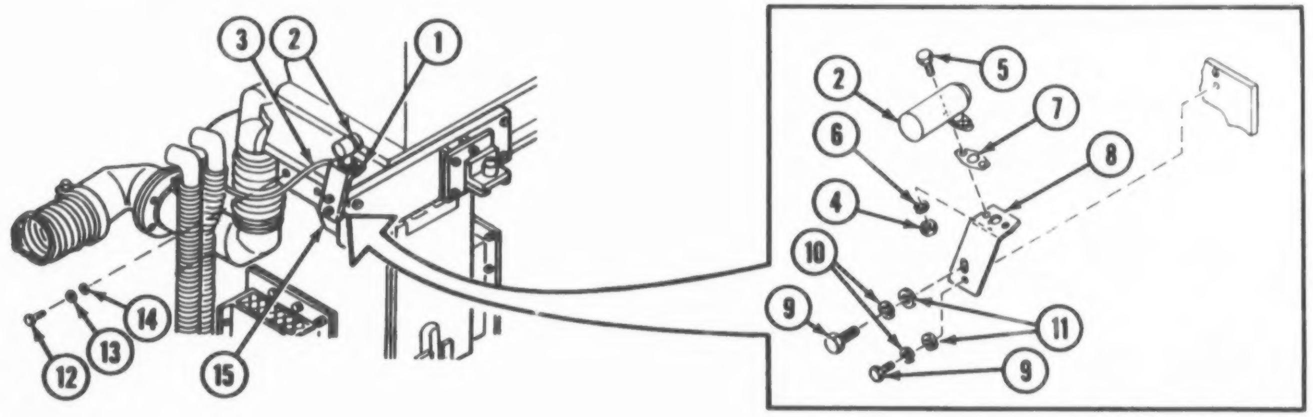
A Loosen fitting (1) at pressure indicator (2) and disconnect pressure indicator hose (3).

B Remove pressure indicator (2) by removing two nuts (4), two screws (5), two lockwashers (6) and gasket (7) from bracket (8). Discard lockwashers and gasket.

C Remove bracket (8) by removing two screws (9), two lockwashers (10) and two flat washers (11). Discard lockwashers.

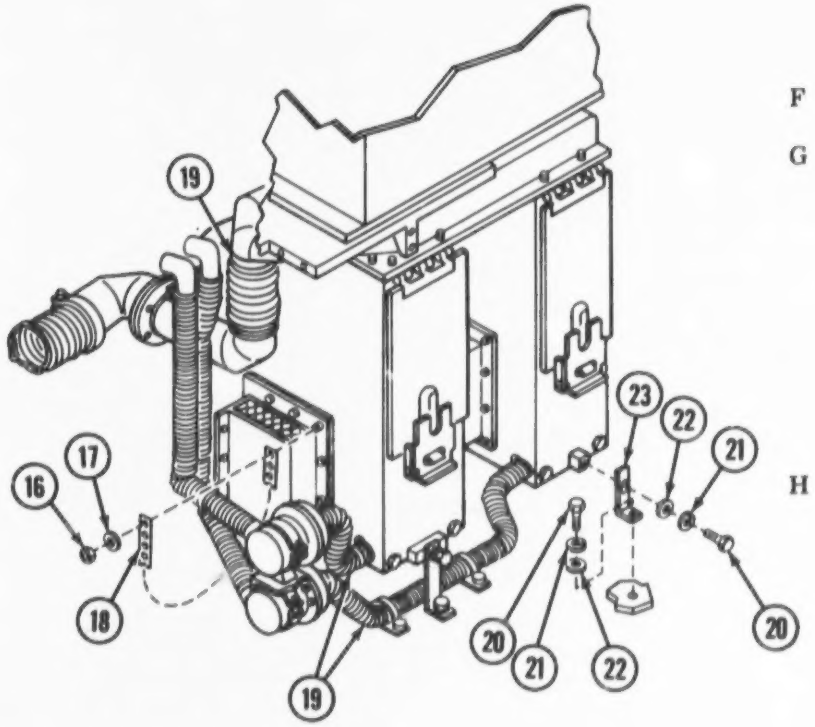
D Remove two screws (12), two lockwashers (13) and two flat washers (14) from right side of support bracket (15) and one screw (12), one lockwasher (13) and one flat washer (14) from left side of support bracket (15). Discard lockwashers.

E Remove support bracket (15) using hammer.



TA57132

AIR CLEANER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



F Remove nut (16), flat washer (17) and strap (18).

G Remove three air inlet ducts and hoses (19) (p 4-29).

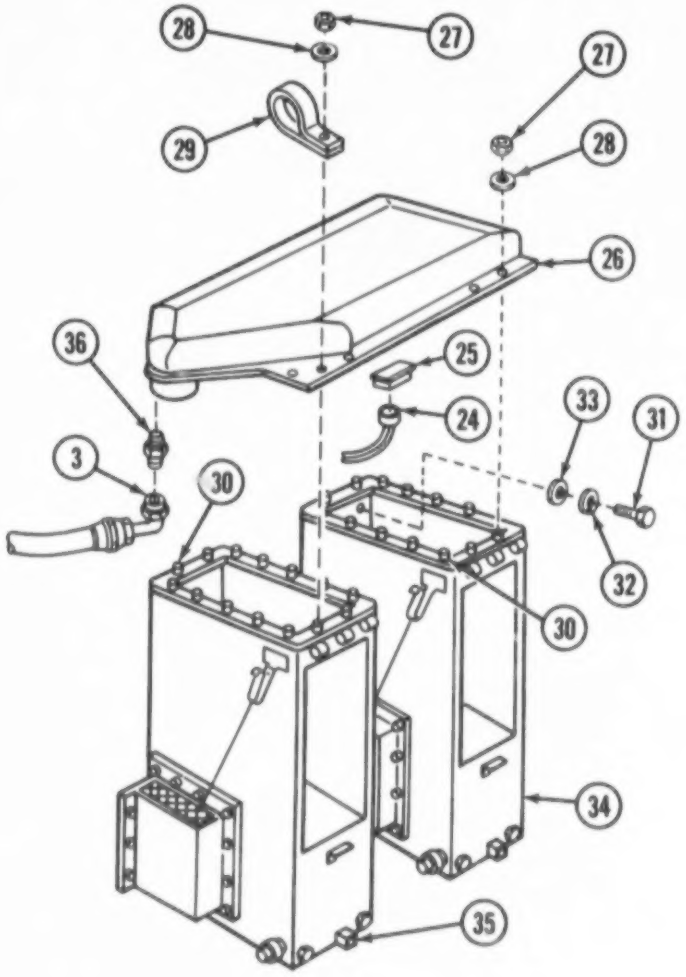
WARNING

Using two persons, place 2 x 4 supports under air cleaner boxes to prevent possible injury to personnel or damage to air cleaner boxes before going to step H.

H Remove four screws (20), four lockwashers (21), four flat washers (22) and two brackets (23). Discard lockwashers.

TA57133

AIR CLEANER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



I Disconnect STE/ICE wiring harness (24) and remove transducer (25) under air cleaner duct (26).

J Remove five nuts (27), five flat washers (28) and STE/ICE harness clamp (29) from stud (30).

K Remove eight screws (31), eight lockwashers (32) and eight flat washers (33). Discard lockwashers.

L Remove 2 x 4 supports and lower boxes (34 and 35) and duct (26) to hull deck.

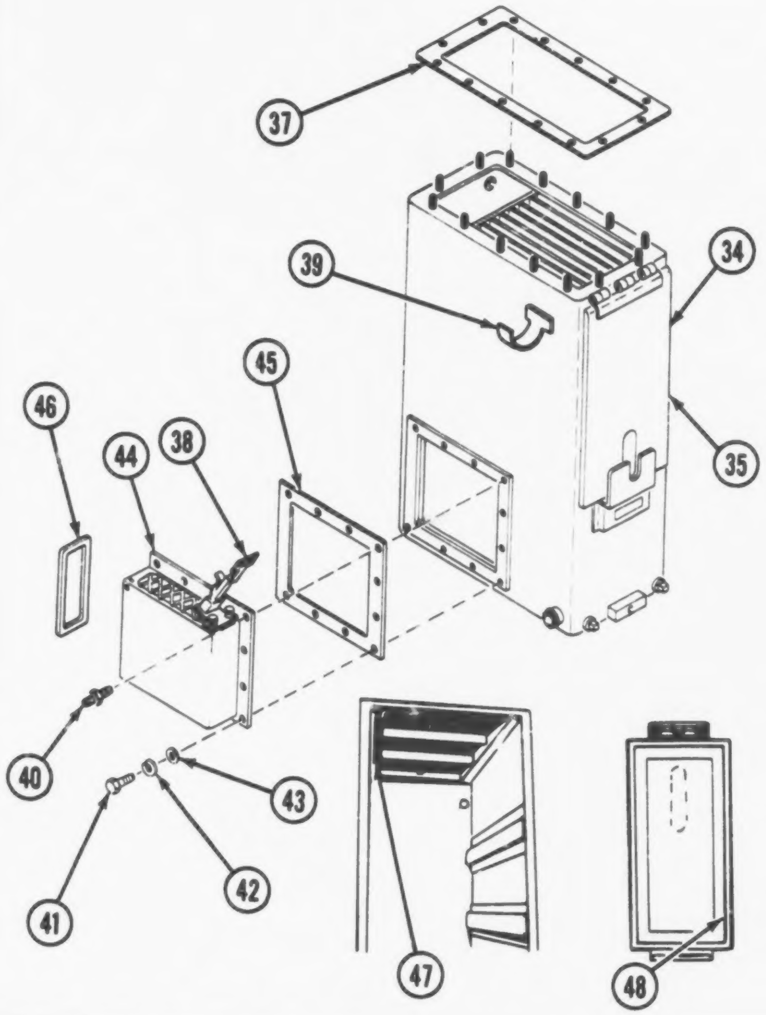
M From inside of air cleaner duct (26) remove 23 nuts (27) and 23 flat washers (28) from studs (30).

N Remove left air cleaner box (35), air cleaner duct (26) and right air cleaner box (34).

O Disconnect pressure indicator hose (3) from adapter (36) under left side of air cleaner duct (26).

TA57134

AIR CLEANER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

NOTE

Both air cleaner boxes are disassembled and assembled in the same manner unless noted otherwise.

A Remove and discard two gaskets (37) from two air cleaner boxes (34 and 35).

B Disconnect baffle cable connector (38) from air box clamp (39) on each box (34 and 35).

NOTE

Shouldered stud (40) is only found on left air cleaner box (35). Right air cleaner box (34) has 10 screws (41).

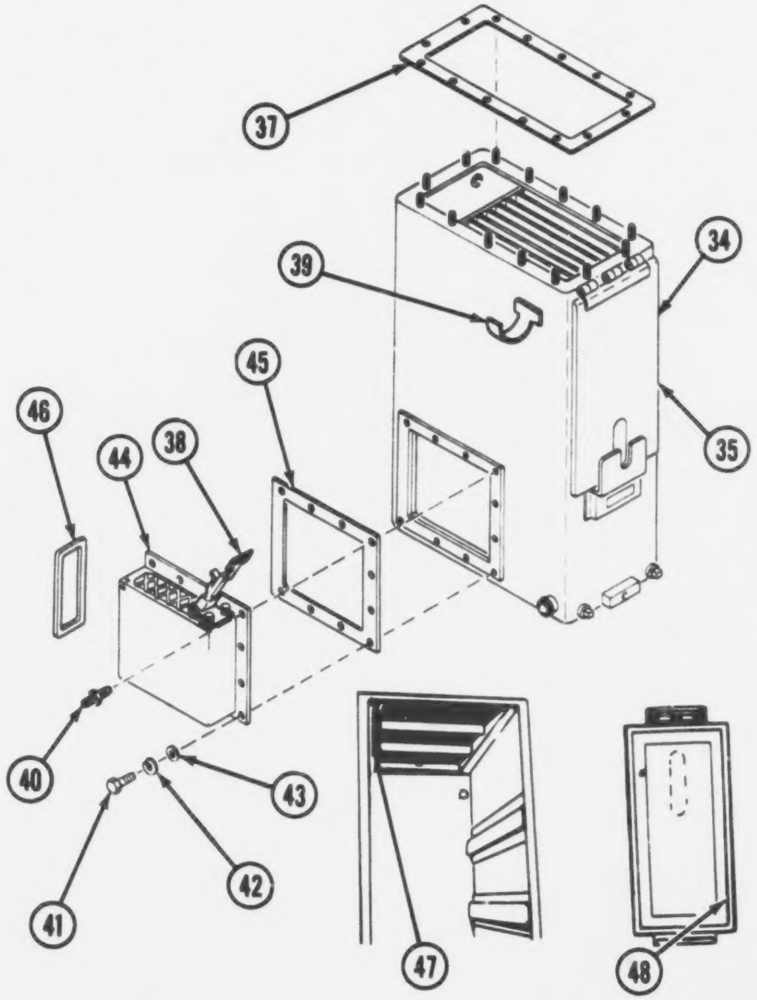
C Remove ten screws (41), ten lockwashers (42), ten flat washers (43), one shouldered stud (40), baffle (44) and gasket (45). Discard lockwashers and gasket.

D Remove and discard two seals (46) from vent at bulkhead.

E Remove and discard two gaskets (47 and 48).

TA57135

AIR CLEANER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Install two new gaskets (47 and 48).

B Apply adhesive (item 4, Appx D) to bulkhead surface and two new seals (46) and install seals (46).

NOTE

Shouldered stud (40) is only found on left air cleaner box (35). Right air cleaner box (34) has 10 screws (41).

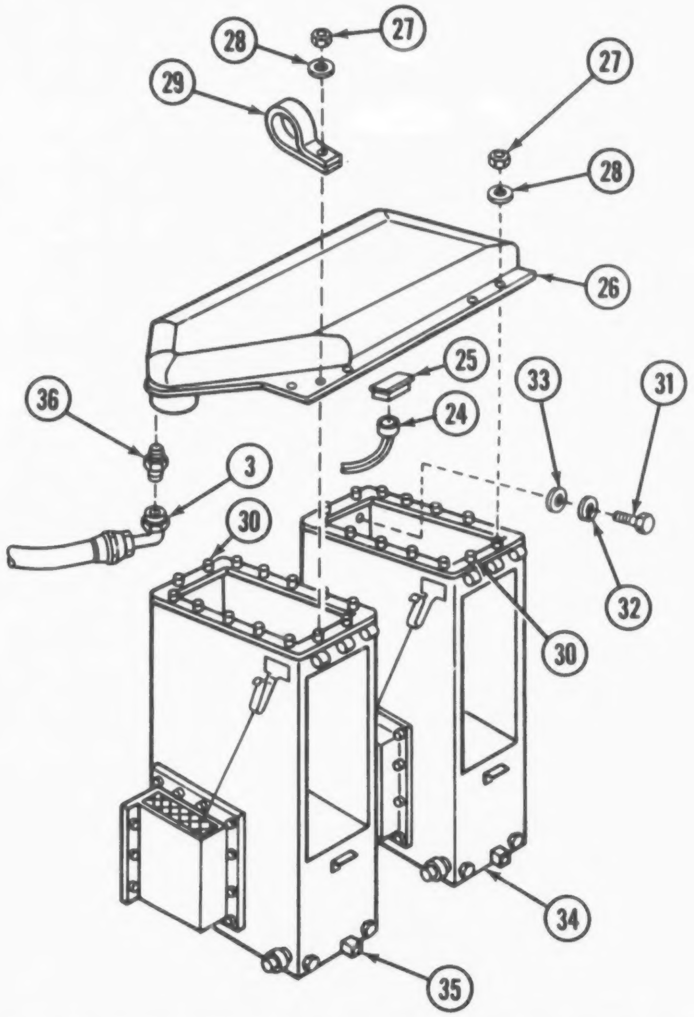
C Install new gasket (45) and baffle (44) with shouldered stud (40), ten screws (41), ten new lockwashers (42) and ten flat washers (43).

D Connect baffle cable connector (38) to air box clamp (39) on each air cleaner box (34 and 35).

E Install two new gaskets (37) on two air cleaner boxes (34 and 35).

TA57148

AIR CLEANER: REMOVAL DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Connect pressure indicator hose (3) to adapter (36) under left side of air cleaner duct (26).

WARNING

Using two persons, place 2 x 4 supports under air cleaner boxes before proceeding to step B to prevent possible injury to personnel or damage to air cleaner boxes.

B Install right air cleaner box (34) and air cleaner duct (26). Hand tighten four flat washers (28) and four nuts (27) inside air cleaner duct (26).

C Place 2 x 4 support under air cleaner box (34).

D Lift air cleaner box (34) and install four screws (31), four new lockwashers (32) and four flat washers (33).

E Install left air cleaner box (35) with 2 x 4 underneath with four screws (31), four new lockwashers (32) and four flat washers (33).

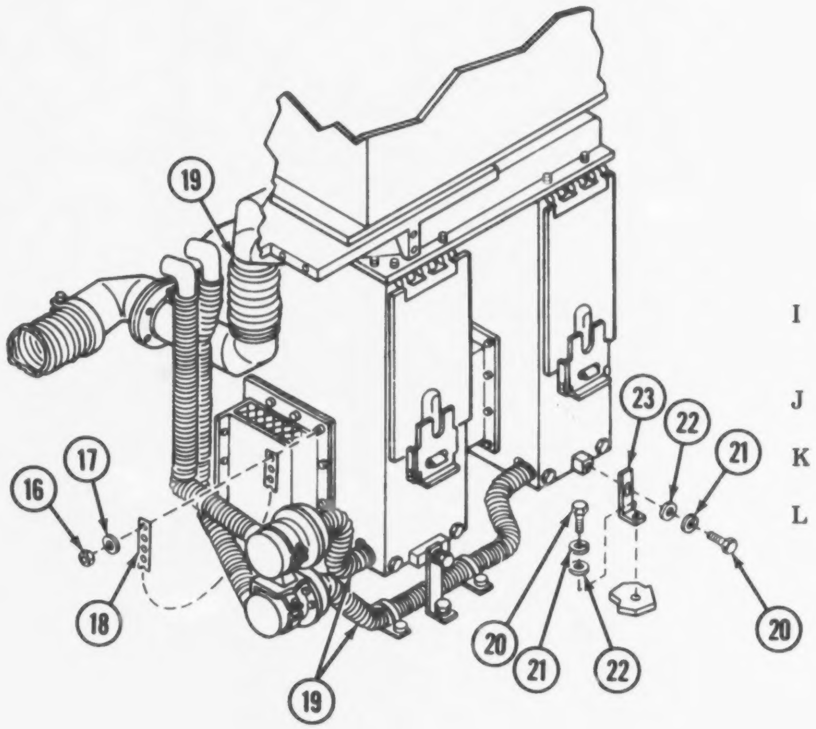
F From inside of air cleaner duct (26) install nineteen flat washers (28) and nineteen nuts (27) on studs (30). Tighten all nuts (27).

G Install five nuts (27), five flat washers (28) and STE/ICE harness clamp (29) on stud (30).

H Connect transducer (25) and STE/ICE harness (24) under air cleaner duct (26).

TA57136

AIR CLEANER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



NOTE

Larger bracket (23) is installed on left air cleaner box (35).

I Install two brackets (23) with four screws (20), four new lockwashers (21) and four flat washers (22).

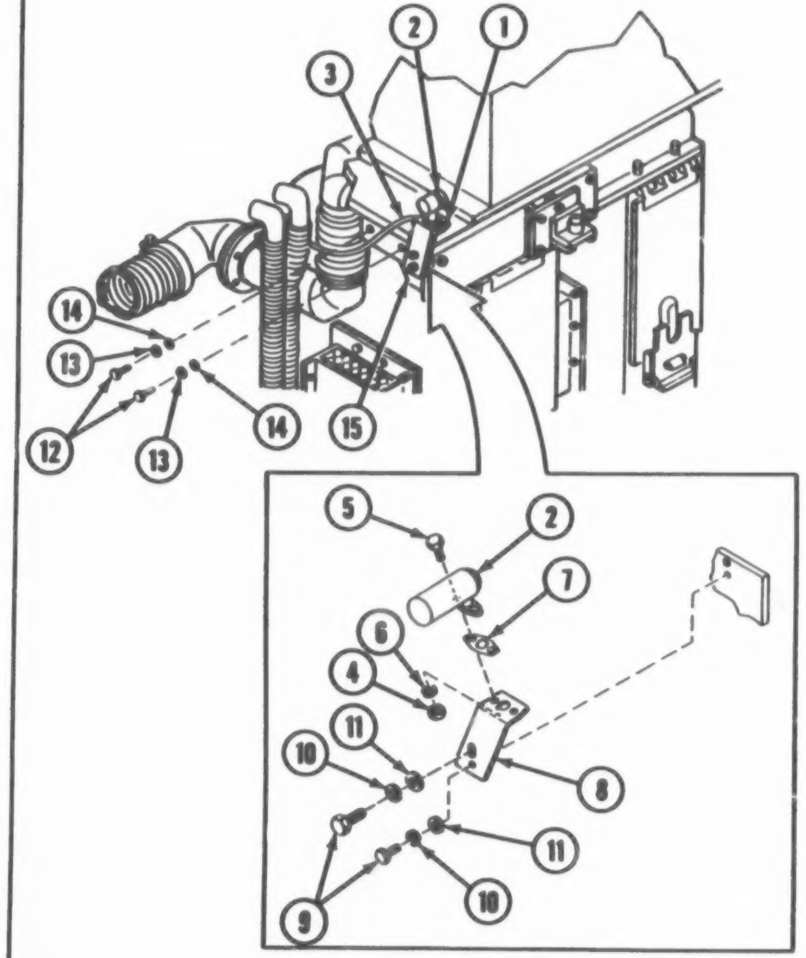
J Remove 2 x 4 supports.

K Install three air inlet ducts and hoses (19) (p 4-29).

L Install strap (18), flat washer (17) and nut (16).

TA57137

AIR CLEANER: REMOVAL DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



M Install support bracket (15) with two screws (12), two new lockwashers (13) and two flat washers (14) on right side and one screw (12), one new lockwasher (13) and one flat washer (14) on left side.

N Install bracket (8) with two screws (9), two new lockwashers (10) and two flat washers (11).

O Install pressure indicator (2) and new gasket (7) on bracket (8) with two screws (5), two new lockwashers (6) and two nuts (4).

P Connect pressure indicator hose (3) at pressure indicator (2) and tighten fitting (1).

TA57138

AIR CLEANER BOX ASSEMBLY: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Materials/Parts:

Dry-cleaning solvent (item 20, Appx D)
Adhesive cement (item 3, Appx D)

Equipment Condition:

Box removed (p 4-25)

Special Tools:

Punch, drive pin 1/16 inch (item 78, Appx B)

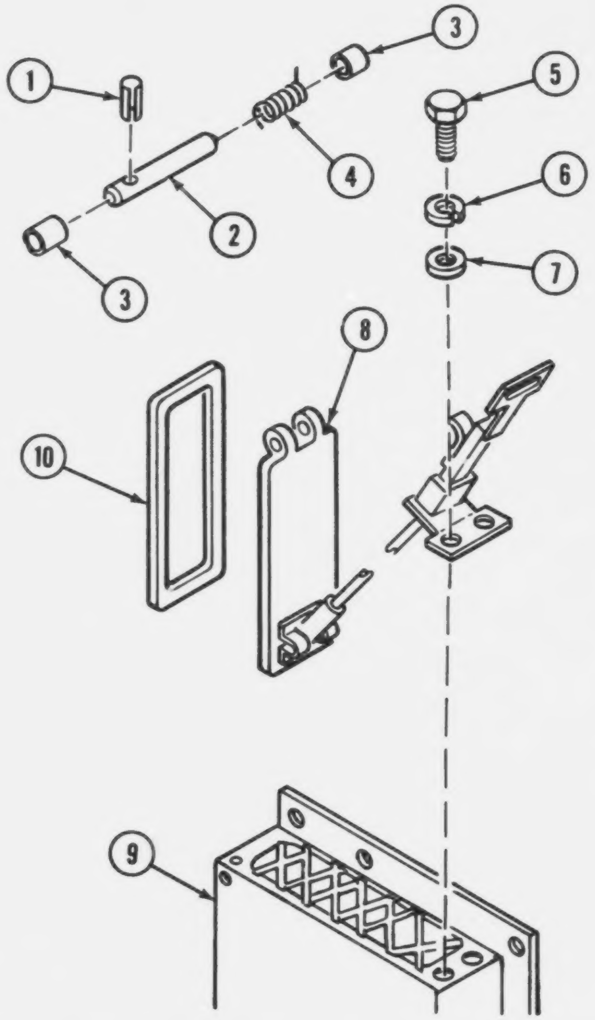
DISASSEMBLY

A Remove spring pin (1) from hinge pin (2). Discard spring pin.

B Remove hinge pin (2), two spacers (3) and spring (4).

C Remove two screws (5), two lockwashers (6), two flat washers (7) and baffle (8) from air cleaner box (9). Discard lockwashers.

D Remove seal (10) from baffle (8). Discard seal.



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AIR CLEANER BOX ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)

ASSEMBLY

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II, it is 138°F (50°C). Do not use near open flame or excessive heat.

A Use dry-cleaning solvent (item 20, Appx D) to clean residue from baffle (8).

B Use adhesive cement (item 3, Appx D) to install new seal (10) on baffle (8).

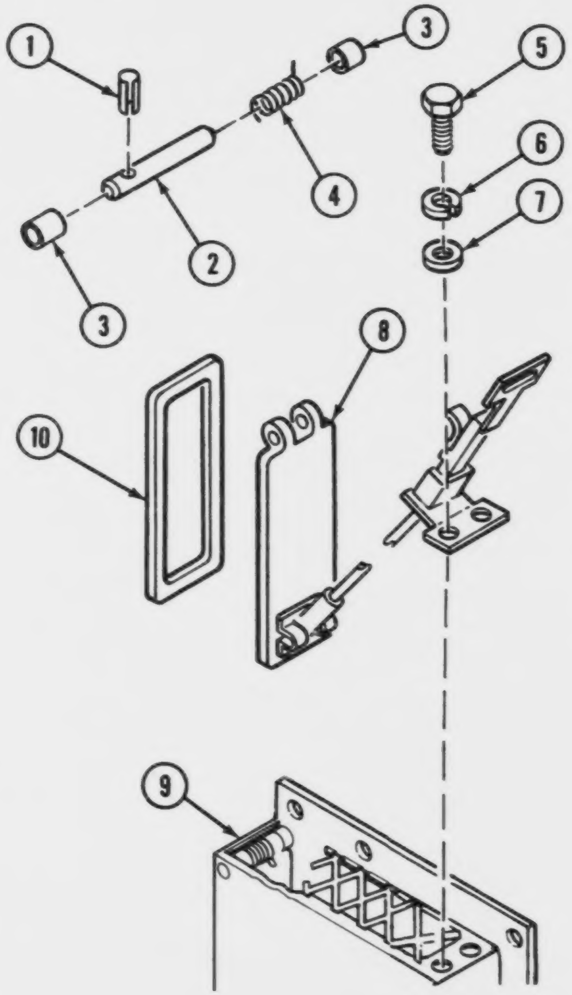
C Install baffle (8) on air cleaner box (9) by installing two flat washers (7), two new lockwashers (6), and two screws (5).

NOTE

Preload spring in reset so that door is spring loaded in closed position.

D Install hinge pin (2), spring (4) and two spacers (3).

E Install new spring pin (1) on hinge pin (2).



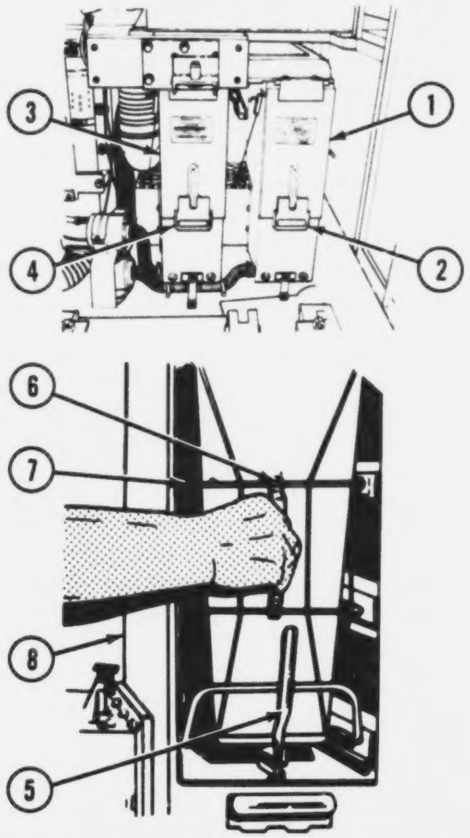
TA57140

AIR FILTER: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Right projectile rack moved to rear of vehicle (TM 9-2350-267-10).



REMOVAL

A Remove right access door (1) by pulling locking latch (2) down and lifting door up.

CAUTION

Do not pull left door up too far to cause binding and damage to door when removing.

B Remove left access door (3) by pulling locking latch (4) down, pulling door up slightly, and sliding door off to right.

C Pull locking handles (5) down. Pull filter pack removal handle (6) to remove filter pack (7) from air cleaner boxes (8).

INSTALLATION

A Install new gasket on each new filter.

B Install filters; aline with outlet gaskets to ensure proper seal. Secure locking handles.

C Install access doors (1 and 3) and secure by pulling locking latches (2 and 4) down and then up.

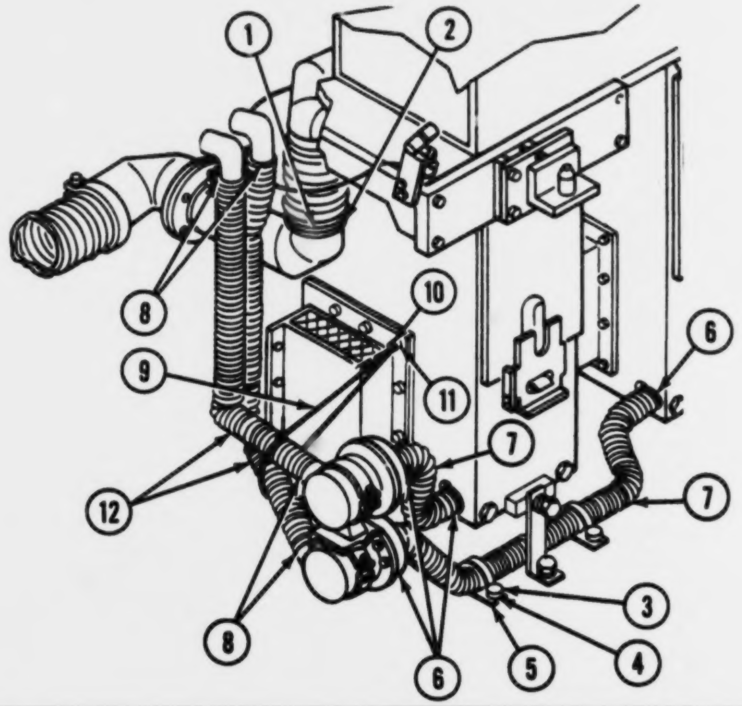
TA57141

DUCTS AND HOSES: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Powerpack removed (p 3-1).
Right projectile rack removed (p 11-5).



REMOVAL

A Loosen two hose clamps (1).

B Remove air cleaner duct-to-elbow duct hose (2).

C Remove two screws (3), two lockwashers (4) and two mounting clamps (5). Discard lockwashers.

D Loosen four hose clamps (6).

E Remove two air cleaner-to-dust exhaust hoses (7).

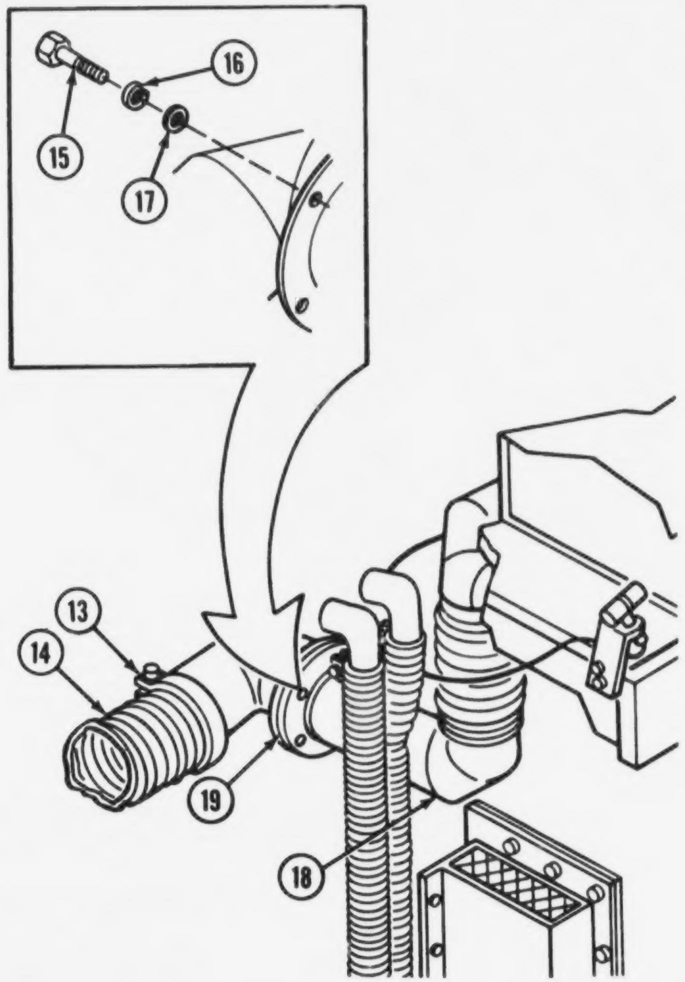
F Loosen four hose clamps (8).

G Remove strap (9) by removing nut (10) and flat washer (11).

H Remove two dust exhaust-to-elbow hoses (12).

TA57142

DUCTS AND HOSES: REMOVAL AND INSTALLATION (CONTINUED)



NOTE

Powerplant must be removed to remove air intake duct and elbow duct.

I Remove hose clamp (13) and turbocharger air intake duct hose (14).

J Remove six screws (15), six lockwashers (16) and six flat washers (17) at powerplant compartment bulkhead. Discard lockwashers.

K Separate elbow duct (18) from bulkhead.

NOTE

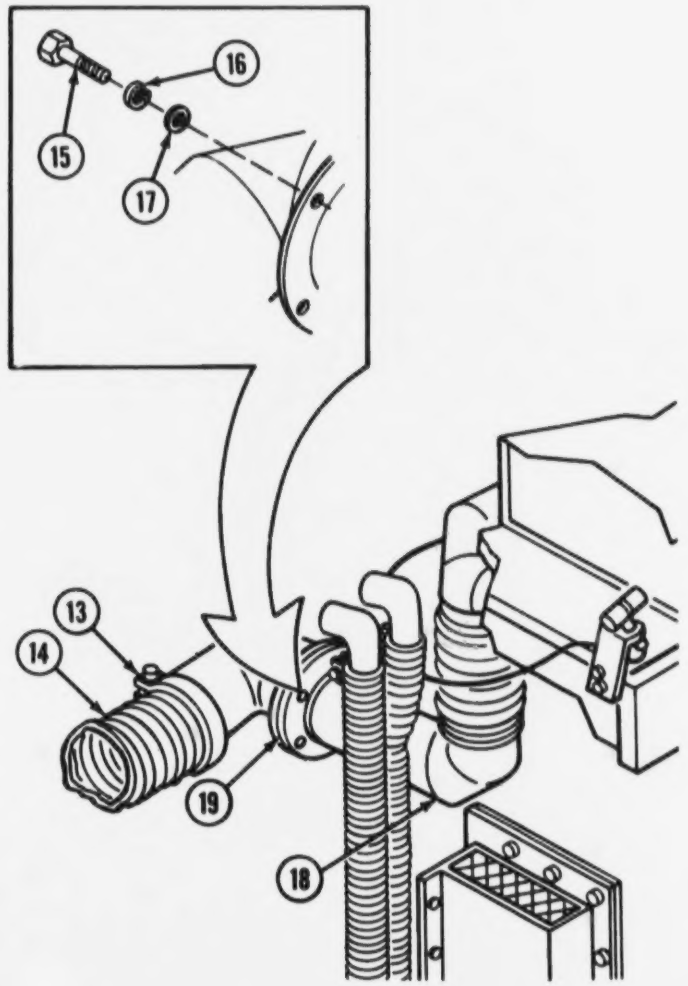
Pull duct through bulkhead into powerplant compartment.

L Remove elbow duct (18).

M Remove and discard gasket (19).

TA57143

DUCTS AND HOSES: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install new gasket (19).

NOTE

Insert duct through bulkhead from powerplant compartment.

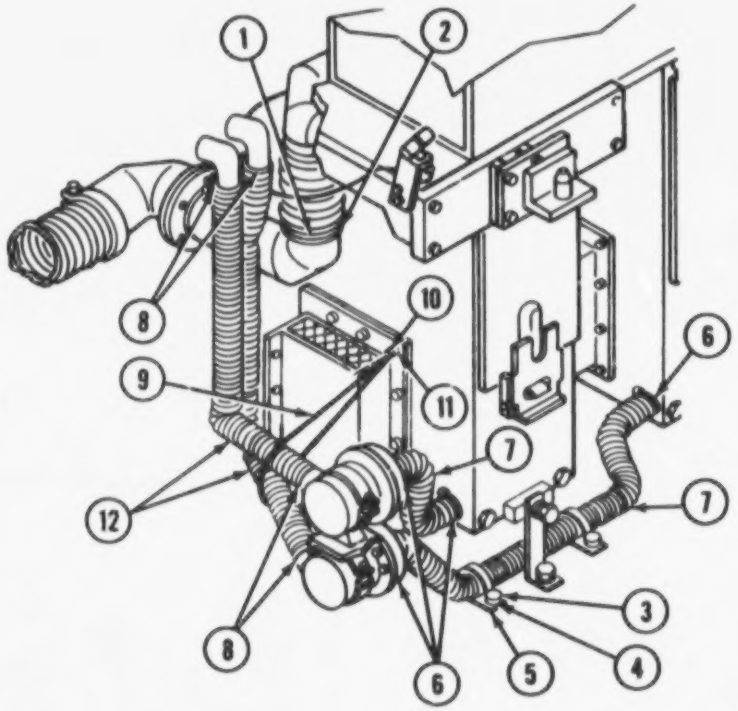
B Install elbow duct (18).

C Connect elbow duct (18) at powerplant compartment bulkhead with six screws (15), six new lockwashers (16) and six flat washers (17).

D Install turbocharger intake duct hose (14) with hose clamp (13).

TA57144

DUCTS AND HOSES: REMOVAL AND INSTALLATION (CONTINUED)



E Install two dust exhaust-to-elbow hoses (12) and tighten four hose clamps (8).

F Install strap (9) with flat washer (11) and nut (10).

G Install two air cleaner-to-dust exhaust hoses (7) and tighten four hose clamps (6).

H Install two mounting clamps (5) with two screws (3) and two new lockwashers (4).

I Install air cleaner duct-to-elbow duct hose (2) and tighten two hose clamps (1).

TA57145

Section III EXHAUST SYSTEM

GENERAL

This section contains instructions on how to remove, install or repair the exhaust system. The exhaust system consists of the following:

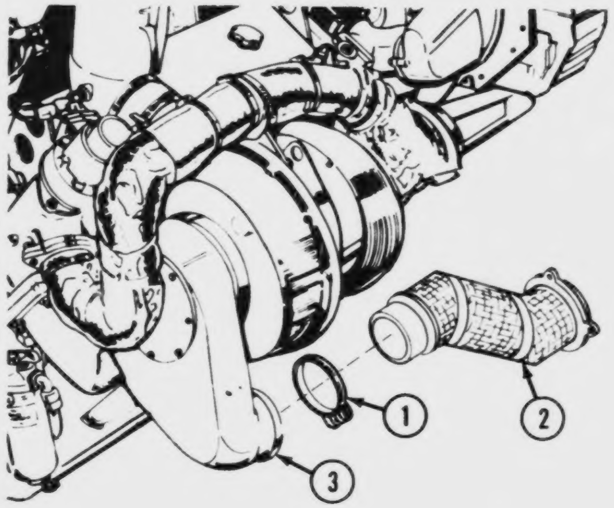
- Exhaust Crossover Tube Insulation
- Exhaust Duct and Pipe

The maintenance procedures are given under the following headings:

- Exhaust Pipe Removal (p 4-32)
- Exhaust Duct Removal (p 4-32)
- Exhaust Duct and Pipe Insulation Removal (p 4-33)
- Exhaust Crossover Tube Insulation Removal (p 4-34)

TA312755

EXHAUST PIPE: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerplant (p 3-1).

B Loosen clamp (1) and pull exhaust pipe (2) from turbocharger blower flange (3).

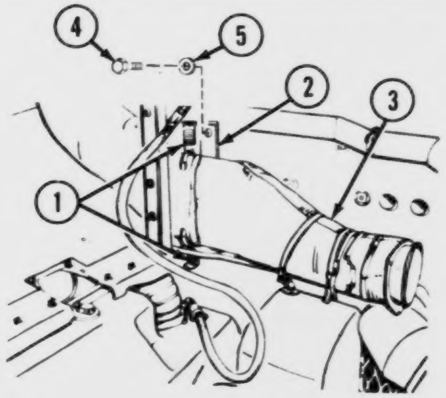
INSTALLATION

A Install exhaust pipe (2) on turbocharger blower flange (3).

B Tighten clamp (1).

C Install powerplant (p 3-1).

EXHAUST DUCT: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerplant (p 3-1).

B Disconnect two springs (1) from hanger (2).

C Remove exhaust duct (3) from vehicle.

D Remove hanger (2) by removing two screws (4) and two flat washers (5).

INSTALLATION

A Install hanger (2) with two screws (4) and two flat washers (5).

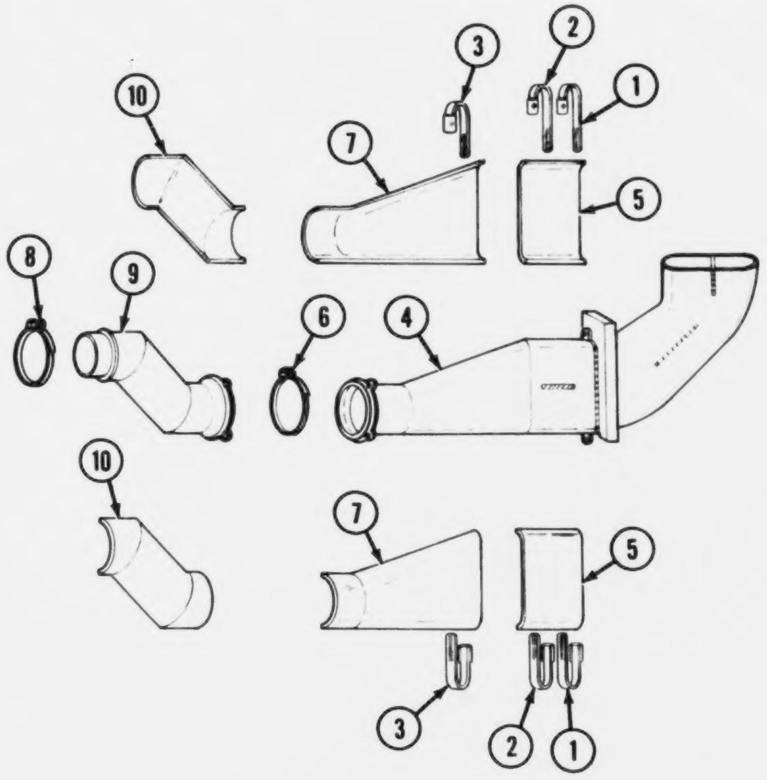
B Install exhaust duct (3) in vehicle.

C Connect two springs (1) to hanger (2).

D Install powerplant (p 3-1).

TA312756

EXHAUST DUCT AND PIPE INSULATION: REMOVAL AND INSTALLATION



REMOVAL

A Remove exhaust duct (p 4-32) and exhaust pipe (p 4-32).

NOTE

Three large clamps (1, 2 and 3) are formed by assembling two smaller clamps. It is only necessary to loosen them at one spot for removal.

B Loosen two large clamps (1 and 2) and slide off exhaust duct (4).

C Remove and discard insulation (5).

D Loosen large clamp (3) and four clamps (6) and slide off exhaust duct (4).

E Remove and discard insulation (7).

F Loosen two clamps (8) and slide off exhaust pipe (9).

G Remove and discard insulation (10).

INSTALLATION

A Install new insulation (10) on exhaust pipe (9) and secure with two clamps (8).

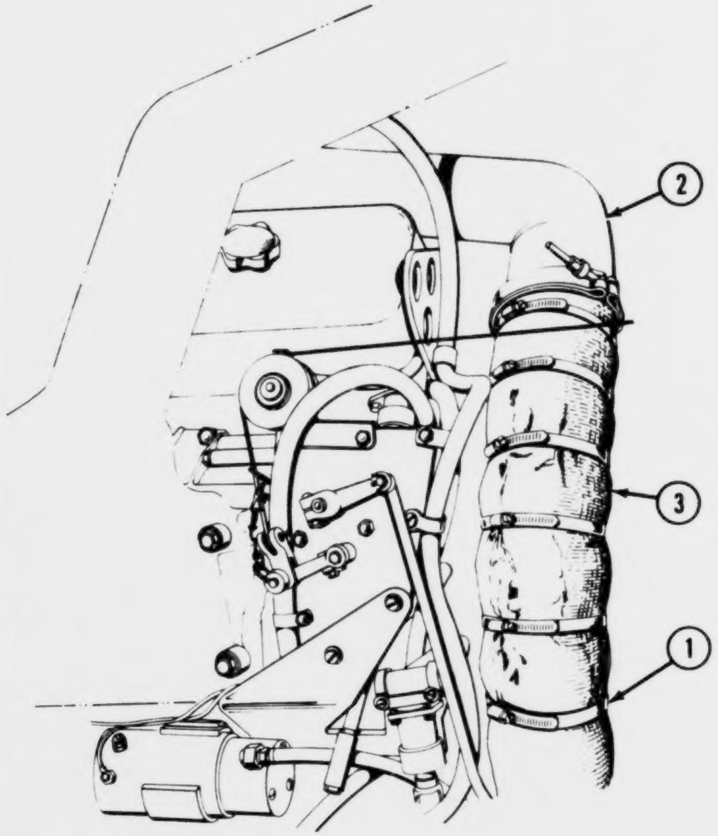
B Install new insulation (7) on exhaust duct (4) and secure with four clamps (6) and large clamp (3).

C Install new insulation (5) on exhaust duct (4) and secure with two large clamps (1 and 2).

D Install exhaust duct (p 4-32) and exhaust pipe (p 4-32).

TA312757 ■

ENGINE CROSSOVER TUBE INSULATION: REMOVAL AND INSTALLATION



REMOVAL

A Open air intake grille (p 3-5).

B Remove front slope plate (p 3-5).

C Remove nine clamps (1) from crossover tube (2).

D Remove and discard insulation (3).

INSTALLATION

A Install new insulation (3) on crossover tube (2).

B Install nine clamps (1).

C Install front slope plate (p 3-5).

D Close air intake grille (p 3-5).

TA312758

CHAPTER 5
ENGINE COMPONENTS MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter illustrates and describes procedures for inspection, removal, disassembly, assembly and installation of the engine components.

Section I Engine Components
Section II Engine Cooling System

Procedures and functions discussed in this chapter are in compliance with authorized organizational maintenance responsibilities as defined in the Maintenance Allocation Chart (MAC).

LUBRICATION

Engine lubrication requirements and procedures are defined in LO 9-2350-267-12.

Section I ENGINE COMPONENTS

GENERAL

This section contains instructions on how to inspect, remove, disassemble, assemble and install engine components. The engine components consist of the following:

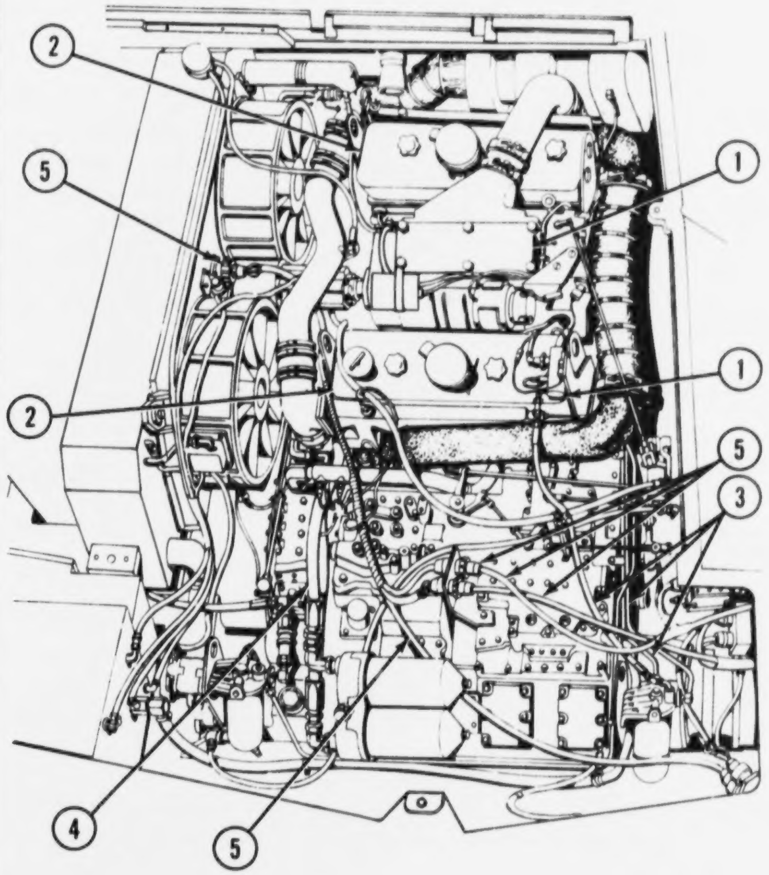
- Engine Inspection
- Oil Cooler Hoses
- Oil Filter and Bracket
- Crankcase and Gear Train Breather Tubes
- Engine Mount Release Bar
- Shock Mount and Bracket
- Fuel Shutoff Assembly

The maintenance procedures are given under the following headings:

- Engine Inspection (p 5-2)
- Oil Cooler Hoses Removal (p 5-4)
- Oil Sampler System Removal (p 5-4.1)
- Oil Filter Removal (p 5-4.3)
- Oil Filter Bracket Removal (p 5-5)
- Crankcase and Gear Train Breather Tubes Removal (p 5-6)
- Engine Mount Release Bar Removal (p 5-8.1)
- Shock Mount and Bracket Removal (p 5-9)
- Fuel Shutoff Assembly Removal (p 5-11)

TA312759

ENGINE INSPECTION



INSPECTION

A Check gaskets and seals (1) and two covers (2) for seepage of fuel and oil.

B Check fuel hoses, tubes and connectors (3) for cracks, leaks and/or seepage of fuel (p 4-2).

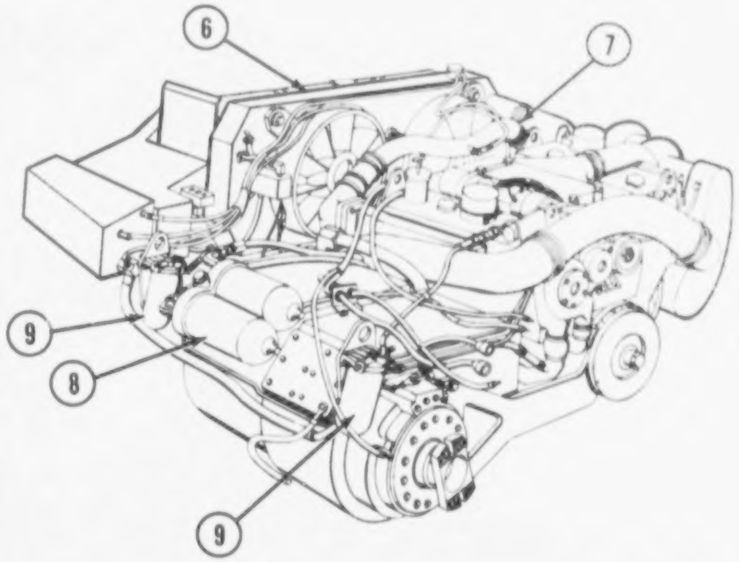
C Check oil hoses, tubes and connectors (4) for cracks, leaks and/or seepage of oil (p 5-4 and 7-7).

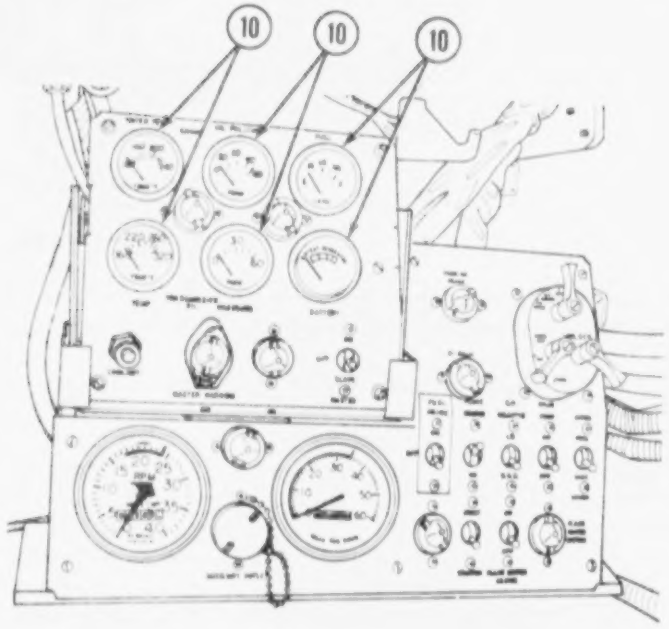
D Check electrical wires, leads and connectors (5) for cracked insulation, oil and grease on cables/connectors. Check for tight connectors (p 6-2).

E Check hull engine compartment floor for pools of oil/fuel and coolant.

TA310294

ENGINE INSPECTION (CONTINUED)





F Check radiator (6) coolant level and specific gravity (p 2-22).

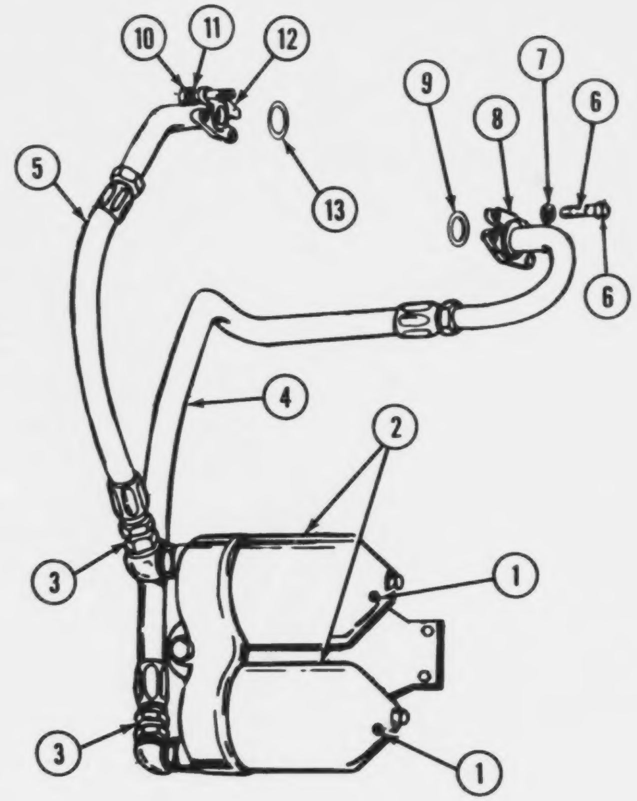
G Check coolant hoses (7) for cracks, deterioration and signs of coolant seepage (p 5-12).

H Check oil filters (8) and fuel filters (9) for collection of sediment on filter elements (TB 43-0210), engine oil filters, transmission oil filters (p 7-9) and fuel filters (p 4-11 and 4-13).

I Start up engine and check instrument panel indicators (10) (TM 9-2350-267-10).

TA310295

OIL COOLER HOSES: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Be sure exhaust is cool before removing hoses.

A Remove two drain plugs (1) from oil filters (2). Drain oil from filters.

B Remove two nuts (3) to disconnect hoses (4 and 5).

C Remove four screws (6) and four lockwashers (7).

D Remove split flange (8), preformed packing (9) and hose (4) from front of engine oil cooler. Discard preformed packing (9).

E Remove four screws (10) and four lockwashers (11).

F Remove split flange (12), preformed packing (13) and hose (5) from rear of engine oil cooler. Discard preformed packing (13).

INSTALLATION

A Reverse removal procedures.

B Install new preformed packing (9 and 13).

C Check engine oil level (LO 9-2350-267-12).

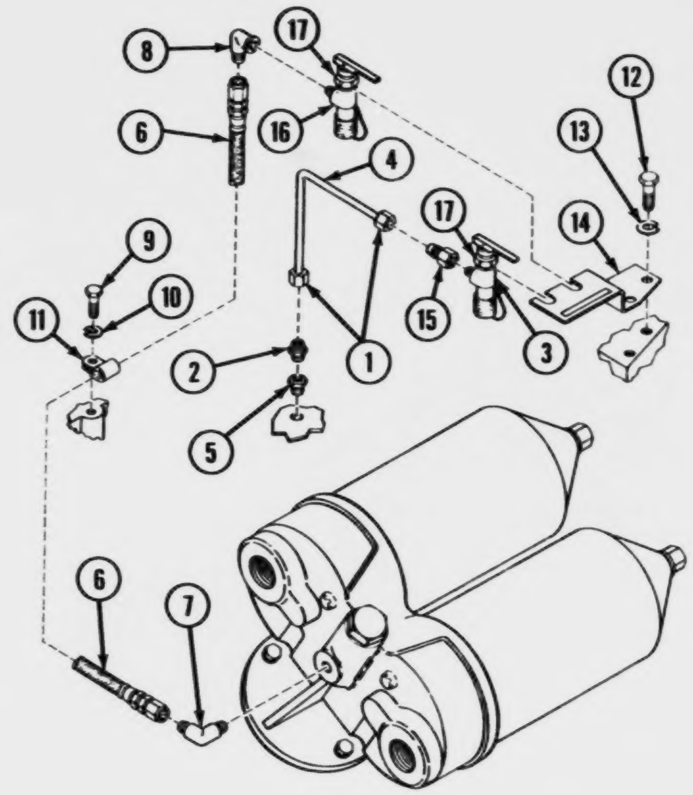
TA310296

OIL SAMPLER SYSTEM: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Tape, Teflon (item 62, Appx D)



REMOVAL

A Open and secure both transmission access doors.

B Loosen two swivel nuts (1) at transmission adapter (2) and oil sampler drain cock (3). Remove tube (4).

C Remove adapter (2) and bushing (5) from transmission.

D Disconnect hose (6) from elbows (7 and 8).

E Remove elbow (7).

F Remove screw (9), lockwasher (10) and clamp (11) from transmission and remove hose (6). Discard lockwasher.

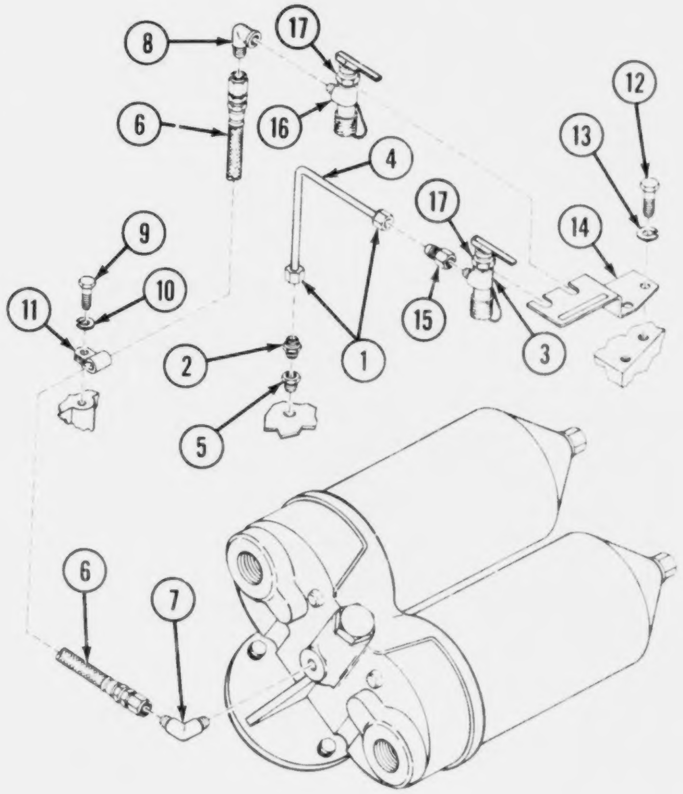
G Remove two screws (12), two lockwashers (13) and mounting bracket (14). Discard lockwashers.

H Remove adapter (15) from drain cock (3) and elbow (8) from drain cock (16).

I Loosen two locknuts (17) and pull drain cocks (3 and 16) from mounting bracket (14).

TA312760 ■

OIL SAMPLER SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTE

Apply Teflon tape (item 62, Appx D) to all male pipe threads during installation.

A Install drain cocks (3 and 16) on mounting bracket (14) and secure by tightening two locknuts (17).

B Install adapter (15) on drain cock (3) and elbow (8) on drain cock (16).

C Install mounting bracket (14) with two screws (12) and two new lockwashers (13).

D Install elbow (7).

E Connect hose (6) to elbows (7 and 8).

F Secure hose (6) to transmission with clamp (11), screw (9) and new lockwasher (10).

G Install bushing (5) and adapter (2) in transmission.

H Install tube (4) and secure at oil sampler drain cock (3) and adapter (2) by tightening two swivel nuts (1).

I Close and secure both transmission access doors.

TA312761 ■

OIL FILTER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

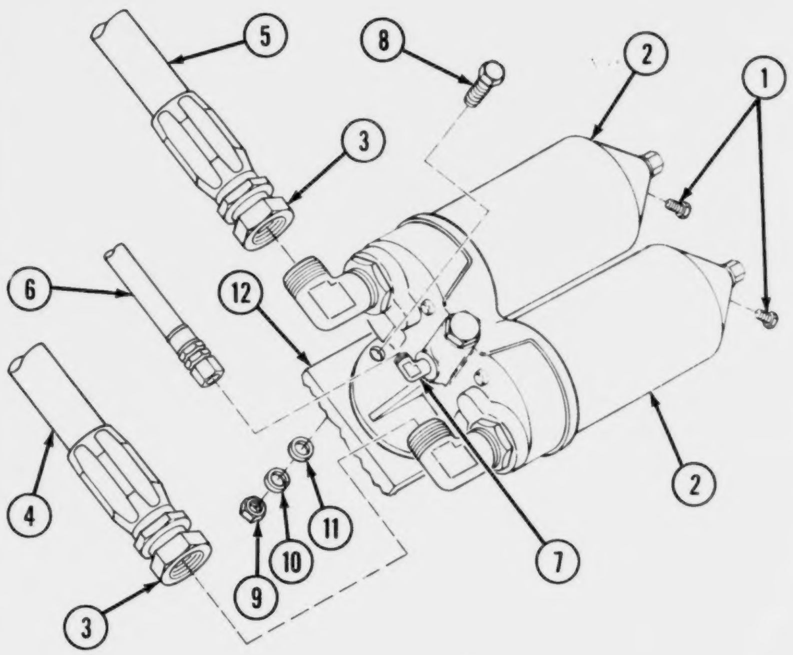
INITIAL SETUP

Test Equipment/Special Tools:

Wrench, torque, 0-175 lb-ft (item 74, Appx B)

References:

LO 9-2350-267-12



REMOVAL

A Remove two drain plugs (1) and drain oil from filters (2) into suitable container.

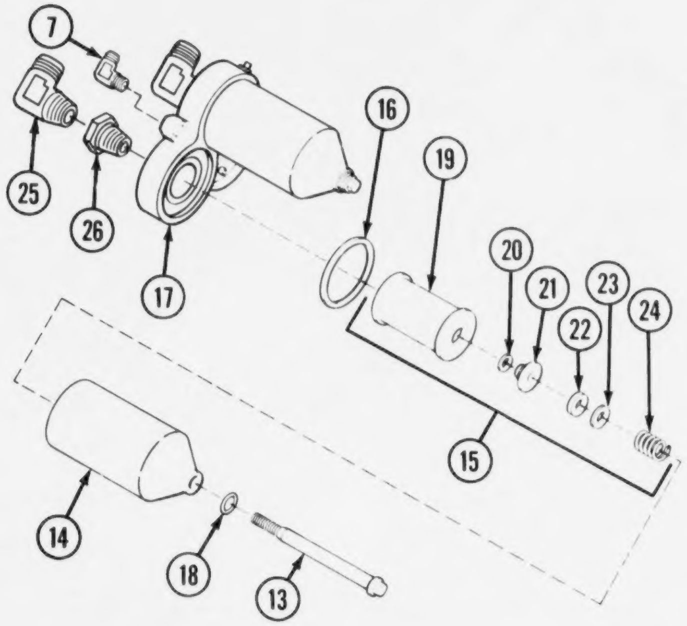
B Unscrew two nuts (3) and disconnect hoses (4 and 5).

C Disconnect hose (6) from elbow (7).

D Remove four screws (8), four nuts (9), four lockwashers (10) and four flat washers (11) and remove oil filters (2) from bracket (12). Discard lockwashers.

TA312762

OIL FILTER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Unscrew two center studs (13).

B Remove two shells (14) with filter element assemblies (15) and two gaskets (16) from adapter (17). Discard gaskets.

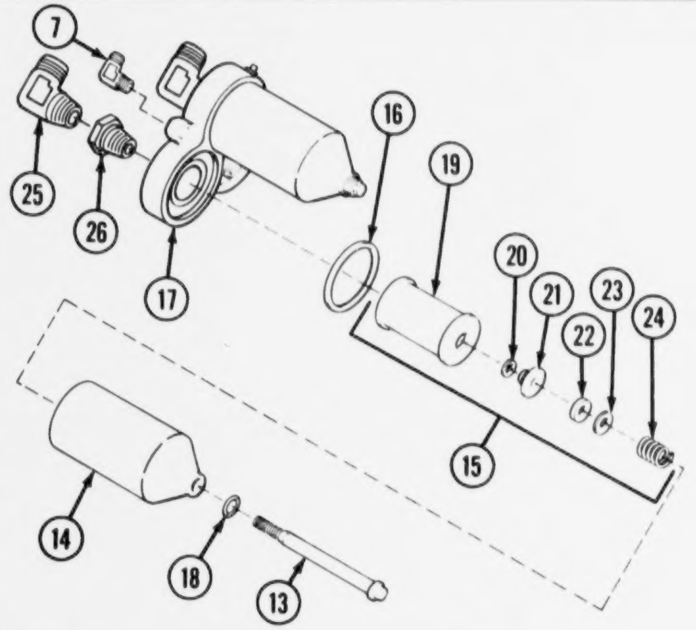
C Remove two center studs (13), two gaskets (18), two filter elements (19), two retaining rings (20), two retainers (21), two gaskets (22), two washers (23) and two springs (24) from shells (14). Discard gaskets.

D Remove elbow (7) from adapter (17).

E Remove two elbows (25) and two bushings (26) from adapter (17).

TA312763

OIL FILTER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



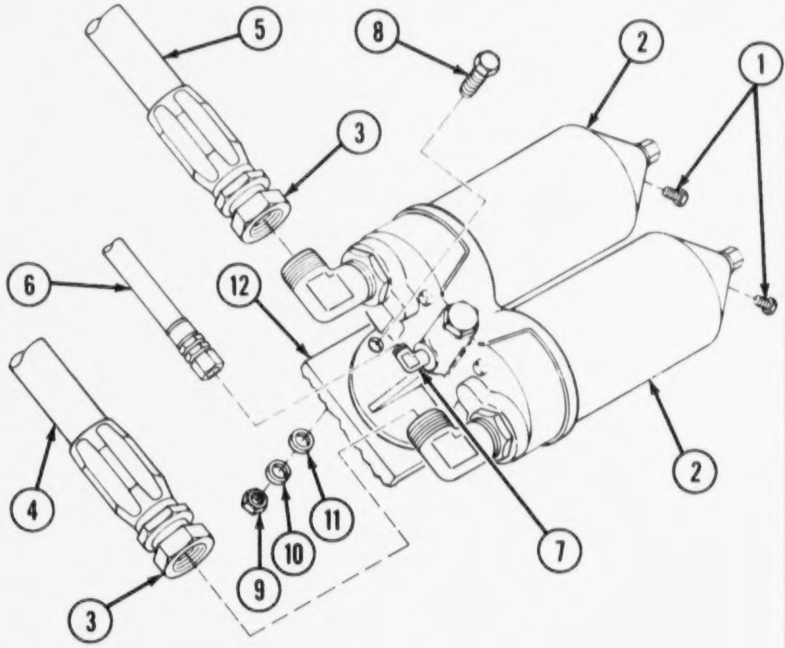
ASSEMBLY

A Install two bushings (26) and two elbows (25) on adapter (17).

B Install elbow (7) on adapter (17).

C Install two springs (24), two washers (23), two new gaskets (22), two retainers (21), two retaining rings (20), two filter elements (19), two new gaskets (18) and two center studs (13) in shells (14).

D Install two shells (14) with filter element assemblies (15) and two new gaskets (16) on adapter (17) and secure by torquing two center studs (13) to 40-50 lb-ft.



INSTALLATION

A Install oil filters (2) on bracket (12) with four screws (8), four flat washers (11), four new lockwashers (10) and four nuts (9).

B Connect hose (6) to elbow (7).

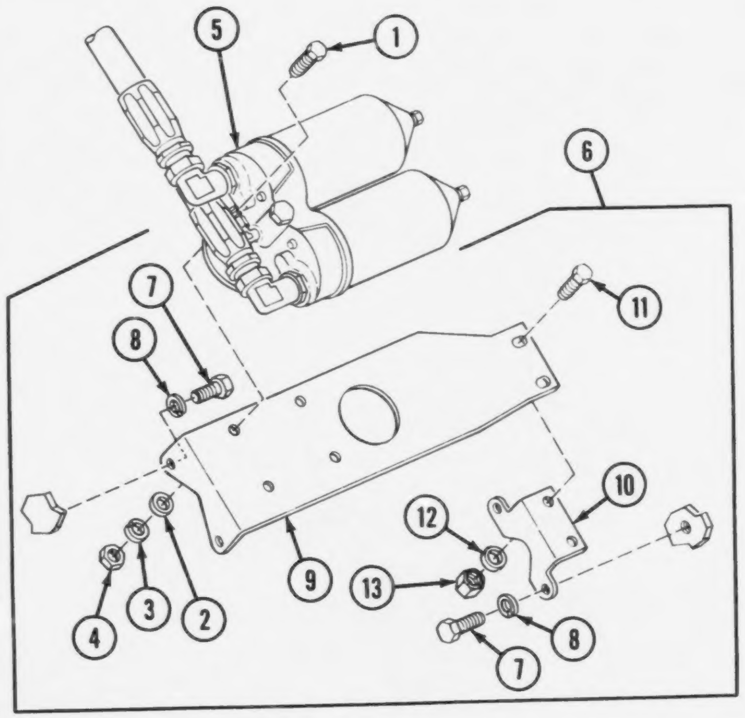
C Connect hoses (4 and 5) and tighten two nuts (3).

D Install two drain plugs (1) in filters (2).

E Check engine oil level (LO 9-2350-267-12).

TA312764

OIL FILTER BRACKET: REMOVAL AND INSTALLATION



REMOVAL

A Open and secure both transmission access doors.

B Remove four screws (1), four flat washers (2), four lockwashers (3) and four nuts (4), securing oil filter assembly (5) to mounting bracket assembly (6). Discard lockwashers.

C Lift oil filter assembly (5) from bracket assembly (6) and lay on transmission.

D Remove four screws (7), four lockwashers (8) and mounting bracket assembly (6) from transmission. Discard lockwashers.

E Separate mounting brackets (9 and 10) by removing two screws (11), two flat washers (12) and two self-locking nuts (13). Discard self-locking nuts.

INSTALLATION

A Secure mounting bracket (9) to bracket (10) with two screws (11), two flat washers (12) and two new self-locking nuts (13).

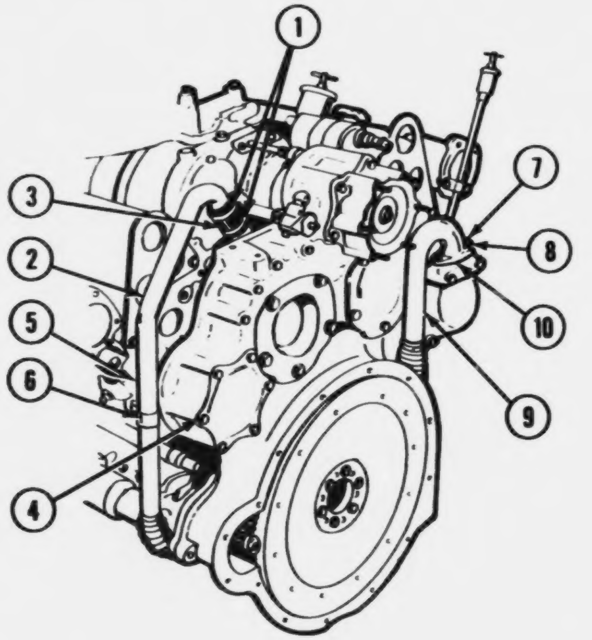
B Install mounting bracket assembly (6) on transmission with four screws (7) and four new lockwashers (8).

C Position oil filter assembly (5) on mounting bracket assembly (6) and secure with four screws (1), four flat washers (2), four new lockwashers (3) and four nuts (4).

D Close and secure both transmission access doors.

TA312765

CRANKCASE AND GEAR TRAIN BREATHER TUBES: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerpack from vehicle (p 3-1).

B Unscrew screws to loosen two clamps (1).

C Pull crankcase breather tube (2) out of hose (3).

D Remove screw (4), nut (5) and retaining collar (6).

E Remove two screws (7) and two washers (8).

F Remove gear train breather tube (9).

G Remove gasket (10) and discard.

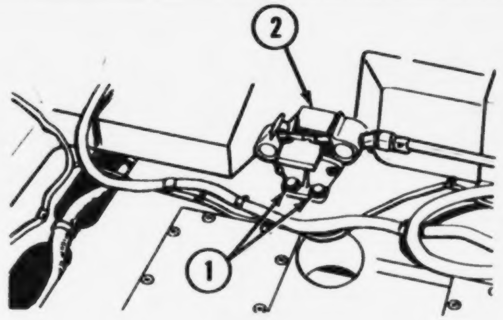
INSTALLATION

A Reverse removal procedures.

B Replace gasket (10).

TA310298

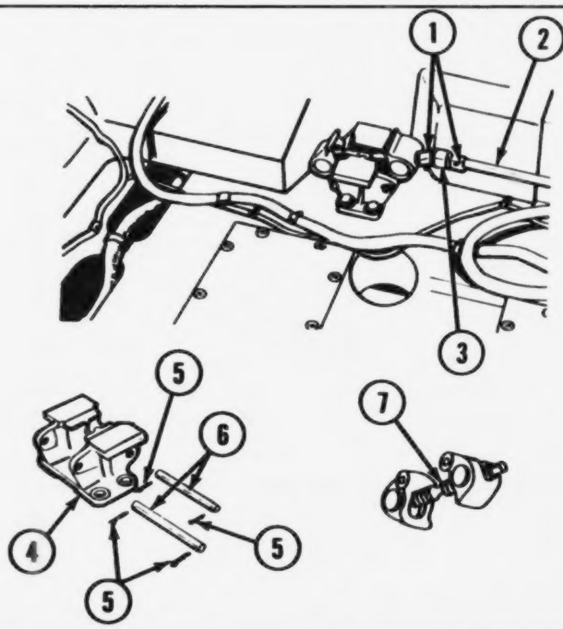
MOUNT BASE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove powerpack (p 3-1).

B Remove four screws (1) and mount base assembly (2) using a box wrench.



DISASSEMBLY

A Remove two cotter pins (1) and discard.

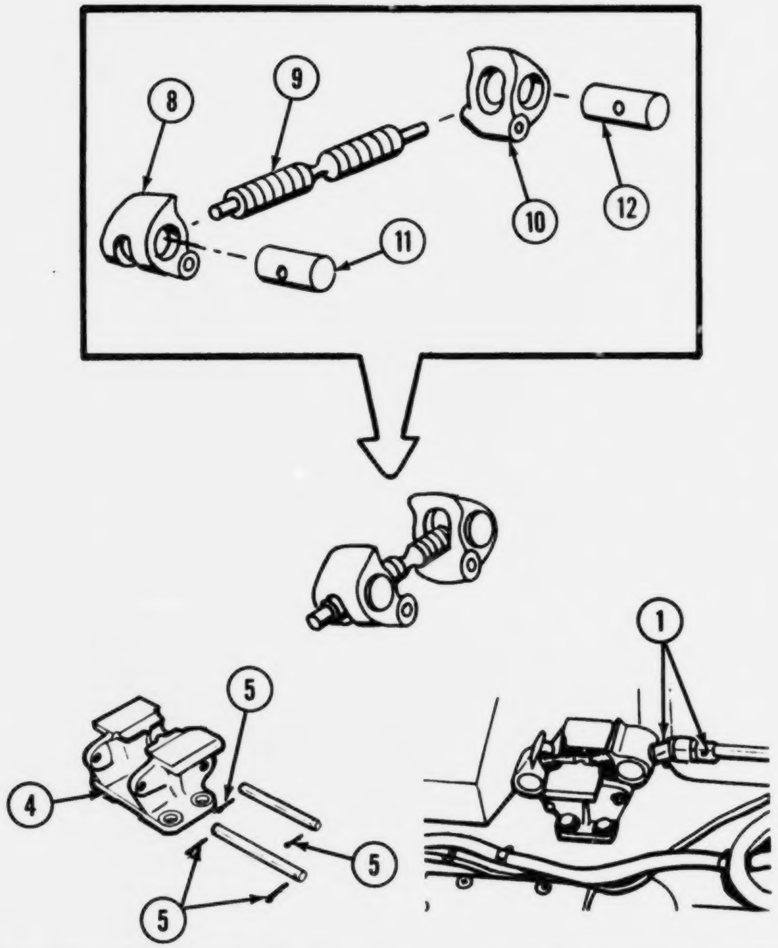
B Separate and remove mount handle (2) and universal joint (3) from mount base (4).

C Remove four cotter pins (5) and two jaw pins (6). Discard four cotter pins (5).

D Remove jaw assembly (7) from mount base (4).

TA310299

MOUNT BASE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



E Turn jaw (8) counterclockwise to remove from bolt (9).

NOTE

Inspect mount base (4), jaws (8 and 10) and jaw nuts (11 and 12) for cracks.

F Turn jaw (10) clockwise to remove from bolt (9).

G Slide jaw nuts (11 and 12) out of jaws (8 and 10).

NOTE

Inspect bolt (9) and jaw nuts (11 and 12) for damaged threads.

ASSEMBLY

Reverse disassembly procedures.

NOTES

Replace two cotter pins (1) and four cotter pins (5).

Make sure jaws (8 and 10) are evenly spaced on bolt (9) during assembly.

Make sure hexhead on bolt (9) is installed on high side of mount base (4).

INSTALLATION

Reverse removal procedures.

TA310300

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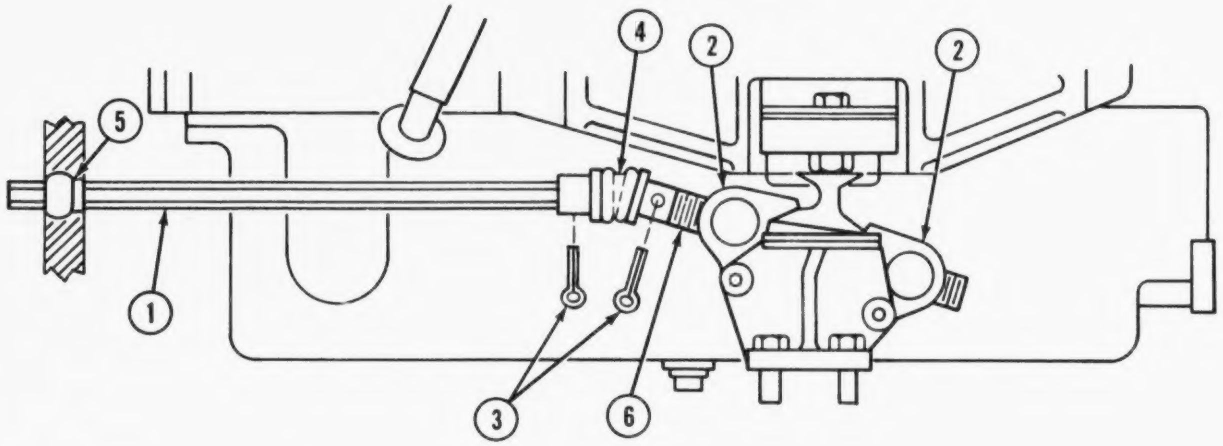
ENGINE MOUNT RELEASE BAR: REMOVAL AND INSTALLATION



REMOVAL

A Remove engine compartment access cover (p 9-25).

B Turn engine mount release bar (1) counterclockwise to open mount jaws (2).

C Remove and discard two cotter pins (3) from universal joint (4).

D Pull engine mount release bar (1) and bushing (5) into driver's compartment.

E Remove universal joint (4) from engine mount tie rod (6).

INSTALLATION

A Install universal joint (4) on engine mount tie rod (6) and secure with new cotter pin (3).

B Insert bushing (5) and engine mount release bar (1) through driver's compartment bulkhead.

C Secure engine mount release bar (1) to universal joint (4) with new cotter pin (3).

D Turn engine mount release bar (1) clockwise to close mount jaws (2).

E Install engine compartment access cover (p 9-25).

TA312766 ■

SHOCK MOUNT AND BRACKET: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

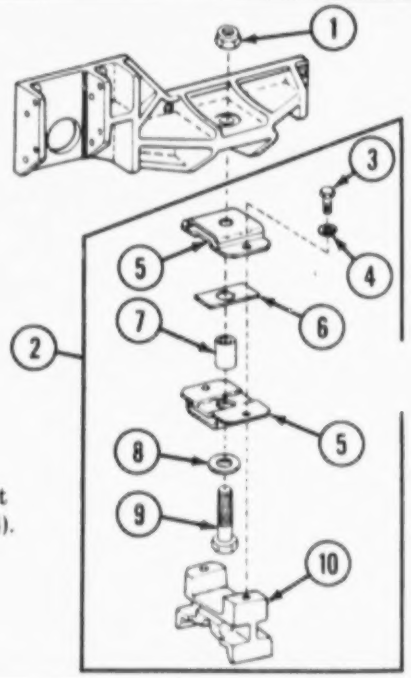
Wrench, torque, 0-175 lb-ft (item 74, Appx B)

Personnel Required:

Three

Equipment Condition:

Powerpack removed (p 3-1).
Hydraulic backup pump bracket and support removed (p 16-24).



REMOVAL

WARNING

Support engine before removing mount.

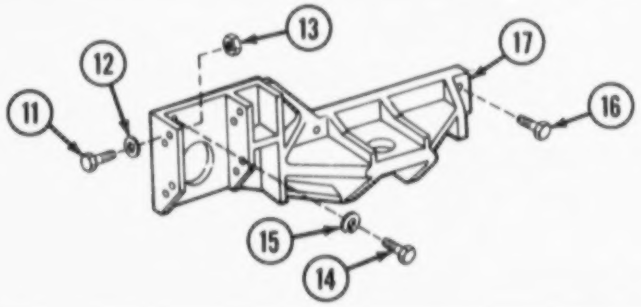
NOTE

Shock mount and bracket are located on lower rear of engine.

A Remove self-locking nut (1) and engine mount group (2). Discard self-locking nut.

B Remove two screws (3) and two lockwashers (4). Discard lockwashers.

C Separate two engine shock mount plates (5), spacer plate (6), spacer sleeve (7), flat washer (8) and screw (9) from mount (10).



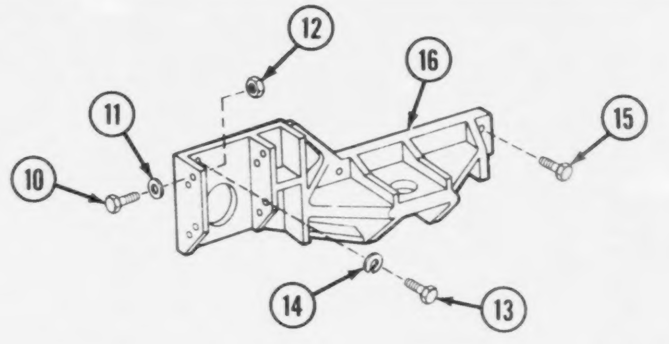
D Remove eight screws (11), eight flat washers (12) and eight nuts (13).

E Remove three screws (14) and three lockwashers (15). Discard lockwashers.

F Remove eight screws (16) and bracket (17) from engine. Inspect mount (10) and bracket (17) for cracks.

TA57146

SHOCK MOUNT AND BRACKET: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

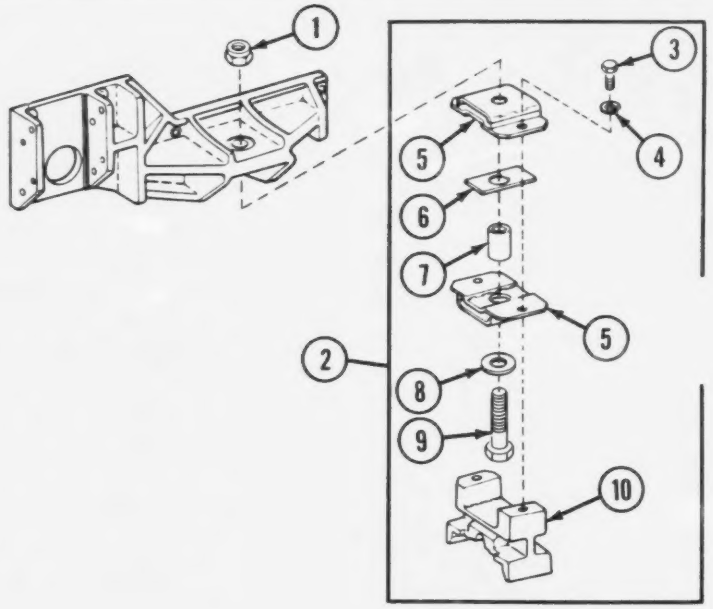
A Install eight screws (16) and bracket (17).

B Torque screws (16) to 60-65 lb-ft.

C Install three screws (14) and three new lockwashers (15).

D Torque screws (14) to 35 lb-ft.

E Install eight screws (11), eight flat washers (12) and eight nuts (13).

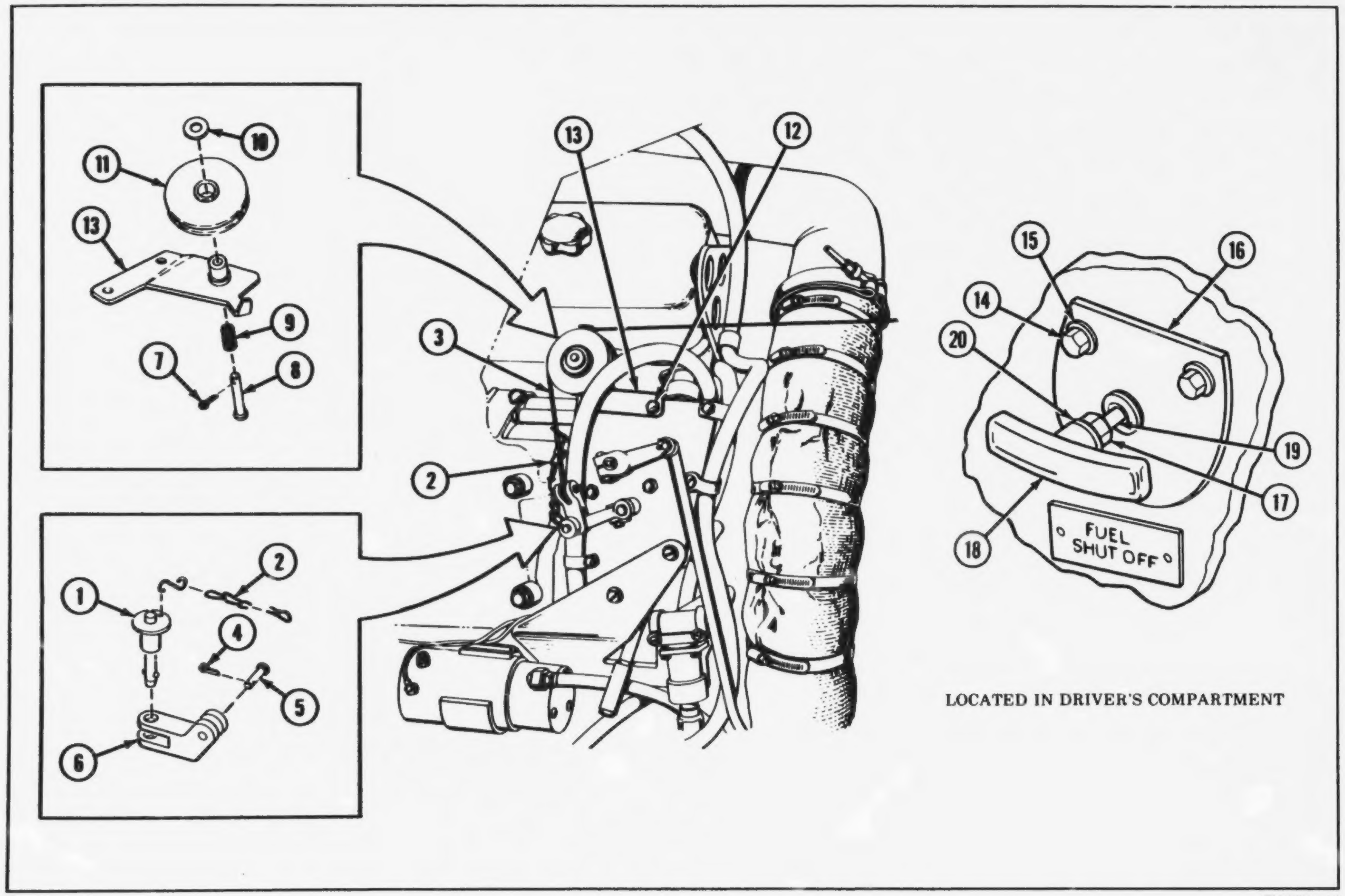


F Install two engine shock mount plates (5), spacer plate (6), spacer sleeve (7), flat washer (8) and screw (9) on mount (10) and secure with two screws (3) and two new lockwashers (4).

G Install engine mount group (2) on bracket (17) with new self-locking nut (1).

TA57147

FUEL SHUTOFF ASSEMBLY: REMOVAL AND INSTALLATION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11
13
9
7
8
2
1
4
5
6
3
13
12
15
16
14
20
19
17
18
FUEL SHUT OFF
LOCATED IN DRIVER'S COMPARTMENT

TA57149

FUEL SHUTOFF ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Open and secure air intake grille and driver's hatch.

B Remove quick-release pin (1).

C Release S-hook and chain (2) from cable (3).

D Remove cotter pin (4), clevis pin (5) and clevis (6). Discard cotter pin.

E Remove cotter pin (7), straight pin (8), spring (9), washer (10) and pulley (11). Separate pulley (11) and cable (3). Discard cotter pin.

F Remove two screws (12) and pulley bracket (13).

G Remove three screws (14) and three lockwashers (15) from FUEL SHUTOFF control assembly (16). Discard lockwashers.

H Remove control assembly (16) and attached cable (3) from vehicle.

I Loosen nut (17) on control assembly (16) by backing it away from handle (18).

J Remove handle (18) from cable (19).

K Remove lockwasher (20) and nut (17). Discard lockwasher.

INSTALLATION

A Install, but do not tighten, nut (17) on cable (19). Install new lockwasher (20) against nut (17).

B Screw handle (18) onto cable (19) until threaded section bottoms in handle. Back off handle to horizontal position.

C Secure handle (18) by tightening nut (17).

D Insert cable (3) through driver's compartment bulkhead.

E Install FUEL SHUTOFF control assembly (16) with three screws (14) and three new lockwashers (15).

F Install pulley bracket (13) with two screws (12).

G Run cable (3) around pulley (11) and install on bracket (13) with straight pin (8), spring (9), washer (10) and new cotter pin (7).

H Install clevis (6) with clevis pin (5) and new cotter pin (4).

I Install S-hook and chain (2) on cable (3).

J Install quick-release pin (1).

K Close and secure air intake grille and driver's hatch.

TA57150

Section II ENGINE COOLING SYSTEM

GENERAL

This section contains instructions on how to clean, remove and install the engine cooling system. The engine cooling system consists of the following:

- Engine Cooling System
- Engine Coolant Main and Lower Tubes (Main Tube Assembly)
- Surge Tank and Pressure Relief Valve
- Aeration Detector
- Radiator and Mounts
- Radiator and Shroud
- Inlet Thermostat and Housing Assembly
- Bypass Thermostat and Housing Assembly
- Coolant Pump
- Hoses and Tubes

The maintenance procedures are given under the following headings:

- Engine Cooling System (p 5-12)
- Engine Coolant Main Tube Assembly Removal (p 5-14)
- Engine Coolant Lower Tube Removal (p 5-15)
- Surge Tank Removal (p 5-16)
- Pressure Relief Valve and Block Mount (p 5-18)
- Aeration Detector Removal (p 5-19)
- Radiator Cleaning (p 5-20)
- Radiator and Mounts Removal (p 5-21)
- Inlet Thermostat and Housing Assembly Removal (p 5-24)
- Bypass Thermostat and Housing Assembly Removal (p 5-26)
- Coolant Pump Removal (p 5-28)
- Hoses and Tubes Removal (p 5-29)

ENGINE COOLING SYSTEM

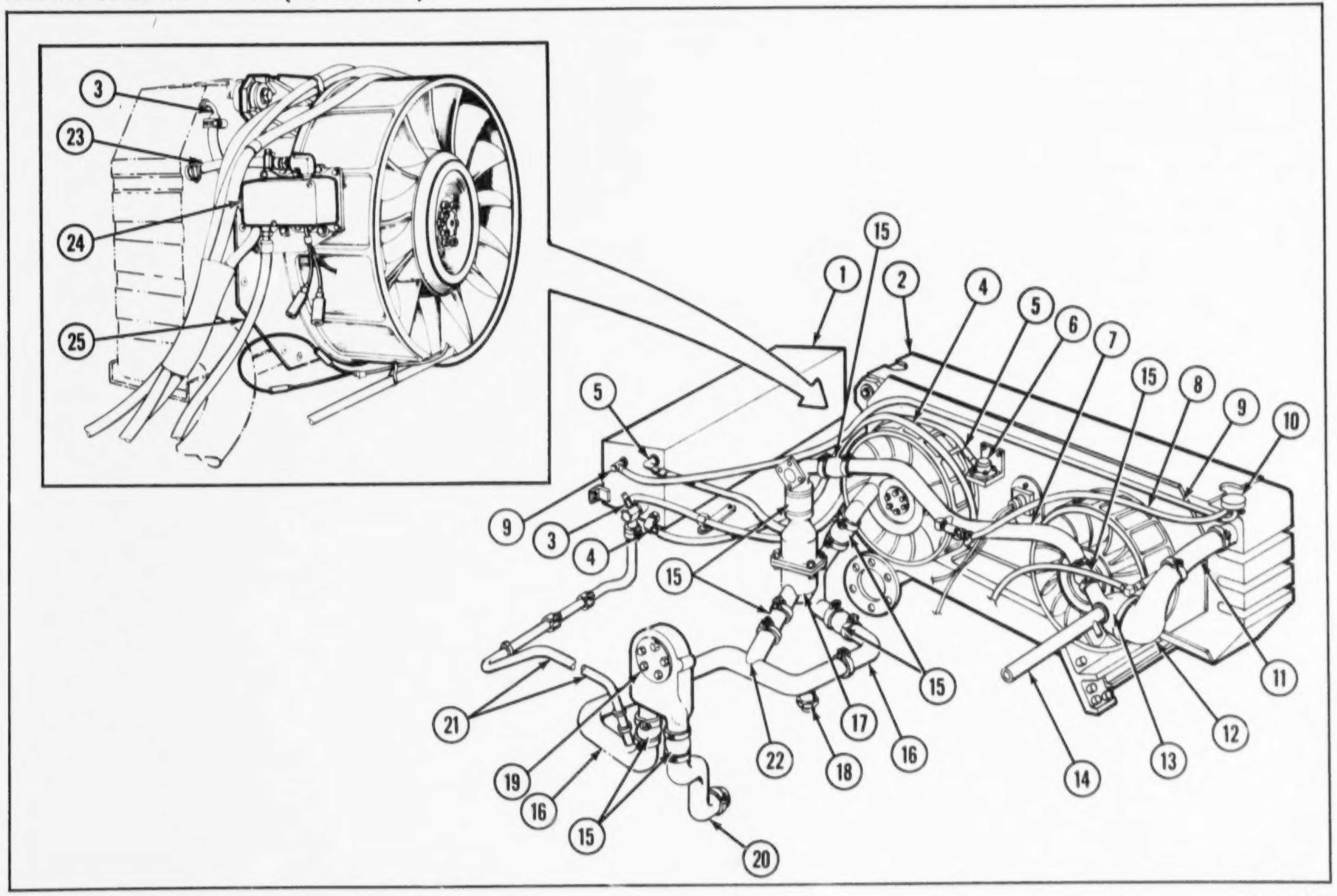
Component/Function

LEGEND

1 Surge tank
2 Radiator
3 Radiator-to-surge tank hose
4 Engine coolant cross-over tube-to-surge tank hose
5 Surge tank-to-pressure relief valve hose
6 Pressure relief valve assembly
7 Engine coolant cross-over tube
8 Engine coolant cross-over tube-to-radiator vent hose
9 Radiator vent-to-surge tank hose
10 Radiator filler cap
11 Inlet thermostat housing-to-radiator inlet hose
12 Inlet thermostat housing
13 Engine coolant manifold connector housing
14 Engine coolant manifold
15 Connector hoses (8)
16 Engine coolant main tube assembly
17 Bypass thermostat housing assembly
18 Engine coolant drain plug
19 Engine coolant pump
20 Engine coolant pump-to-oil cooler tube
21 Surge tank-to-engine coolant pump tube/hose assembly
22 Bypass thermostat housing assembly-to-engine coolant main tube assembly tube
23 Radiator-to-aeration detector hose
24 Aeration detector
25 Aeration detector-to-engine coolant main tube assembly hose

TA312770

ENGINE COOLING SYSTEM (CONTINUED)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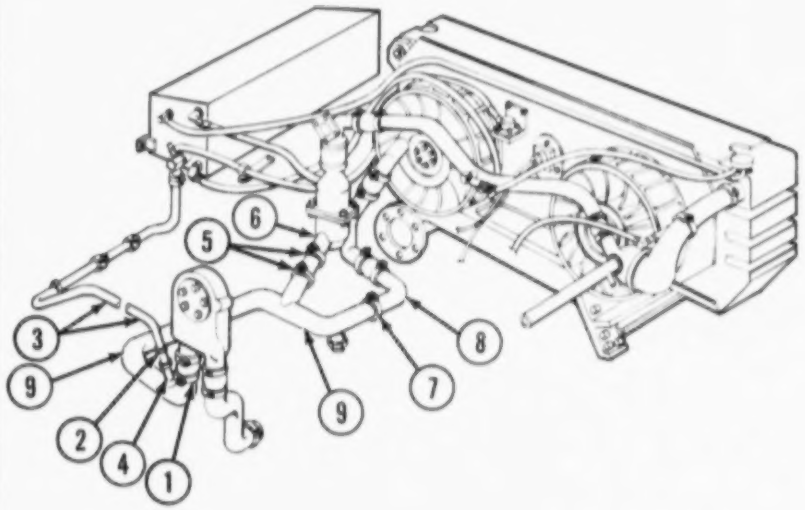
TA310305

ENGINE COOLANT MAIN TUBE ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerpack (p 3-1).

B Loosen clamp (1).

NOTE

Drain coolant system before removal of coolant tubes or hoses.

C Loosen and separate clamp (2) and surge tank tube (3) from nipple (4).

D Loosen clamp (5) at bypass thermostat housing tube (6).

E Loosen clamp (7) at lower main coolant tube (8).

F Remove main coolant tube (9); pull from connectors (1, 5 and 7).

INSTALLATION

NOTES

Use adhesive (item 1, Appx D) at connectors between hoses and mating tubes or castings.

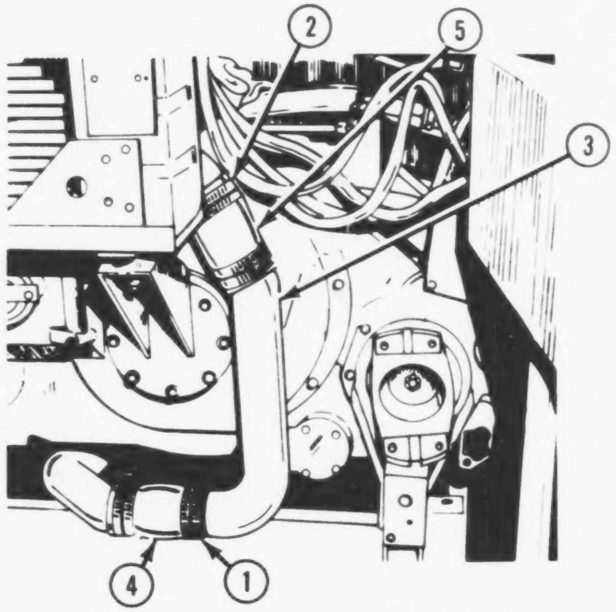
Tighten all hose clamps, run engine minimum of five minutes and check for leaks (torque clamps to 40-60 lb-in).

Hoses must cover unpainted areas of tubes and fittings, or be positioned evenly between red bands on tubes and housings.

Reverse removal procedures.

TA310306

ENGINE COOLANT LOWER TUBE: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerpack (p 3-1).

B Loosen two clamps (1).

C Loosen two clamps (2).

D Remove engine coolant lower tube (3).

E Pull loose at lower tube to main tube hose (4) and radiator to lower tube hose (5).

INSTALLATION

NOTES

Use adhesive (item 1, Appx D) at connectors between hoses and mating tubes or castings.

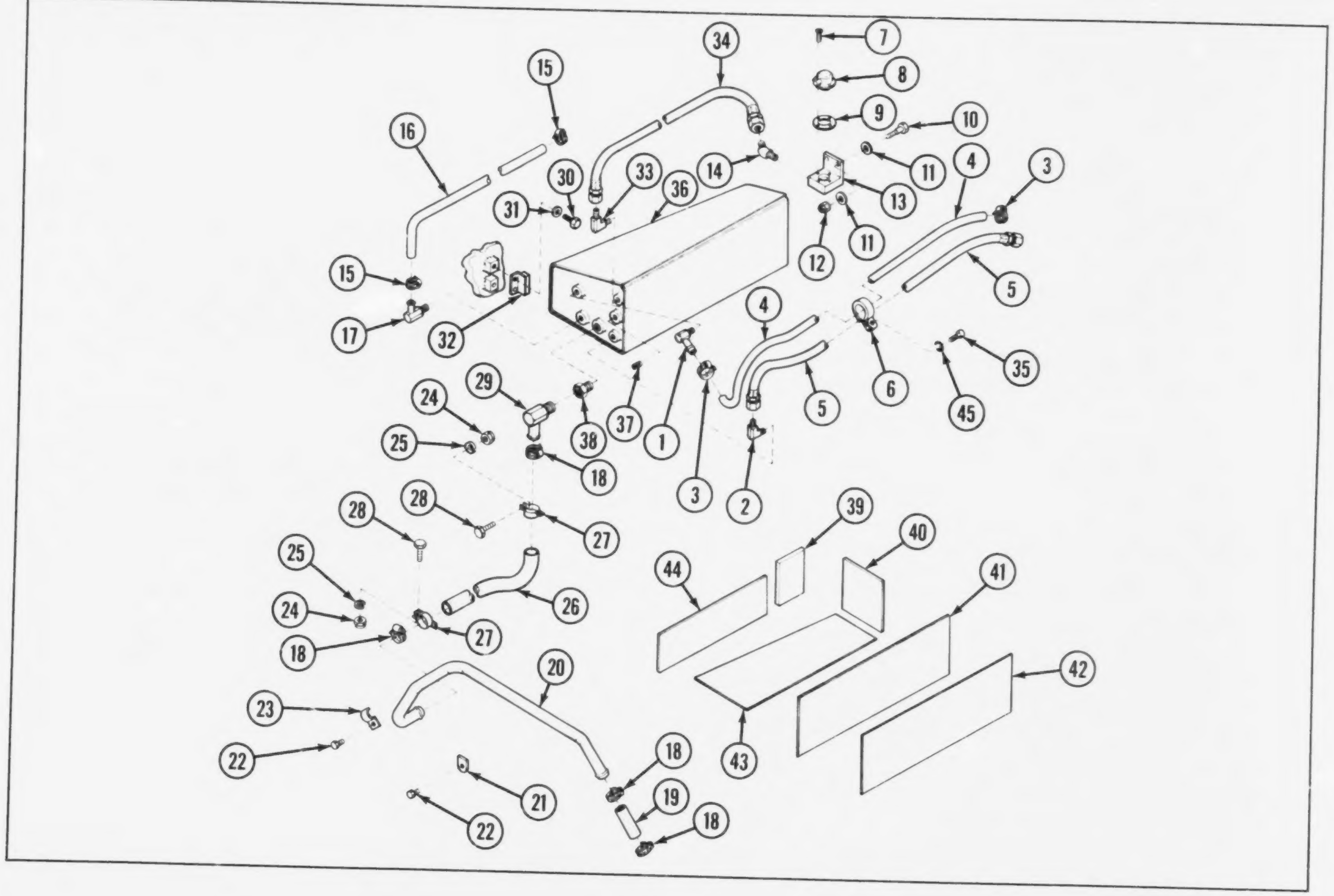
Tighten all hose clamps, run engine minimum of five minutes, and check for leaks (torque clamps to 40-60 lb-in).

Hoses must cover unpainted areas of tubes and fittings, or be positioned evenly between red bands on tubes and housings.

Reverse removal procedures.

TA310307

SURGE TANK AND PRESSURE RELIEF VALVE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TA312771

SURGE TANK AND PRESSURE RELIEF VALVE

LEGEND

1 Elbow
2 Elbow
3 Clamp (2)
4 Hose (radiator vent)
5 Hose (bypass tube)
6 Clamp
7 Screw (4)
8 Pressure relief valve
9 Gasket
10 Screw (2)
11 Flat washer (4)
12 Nut (2)
13 Block
14 Adapter
15 Clamp (2)
16 Hose (radiator)
17 Elbow
18 Clamp (4)
19 Hose
20 Tube
21 Retainer
22 Screw (2)
23 Retainer
24 Nut (2)
25 Lockwasher (2)
26 Hose (main tube)
27 Clamp (2)
28 Screw (2)
29 Elbow
30 Screw (2)
31 Flat washer (2)
32 Retainer
33 Elbow
34 Hose (relief valve)
35 Screw
36 Surge tank
37 Plug
38 Pipe connector
39 Cushioning pad
40 Cushioning pad
41 Radiator surge pad
42 Cushioning pad
43 Radiator pad
44 Cushioning pad
45 Lockwasher

TA312772

SURGE TANK: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

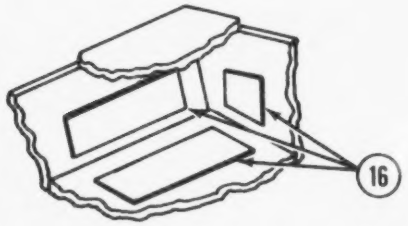
Adhesive (item 1, Appx D)
Dry-cleaning solvent (item 19, Appx D)

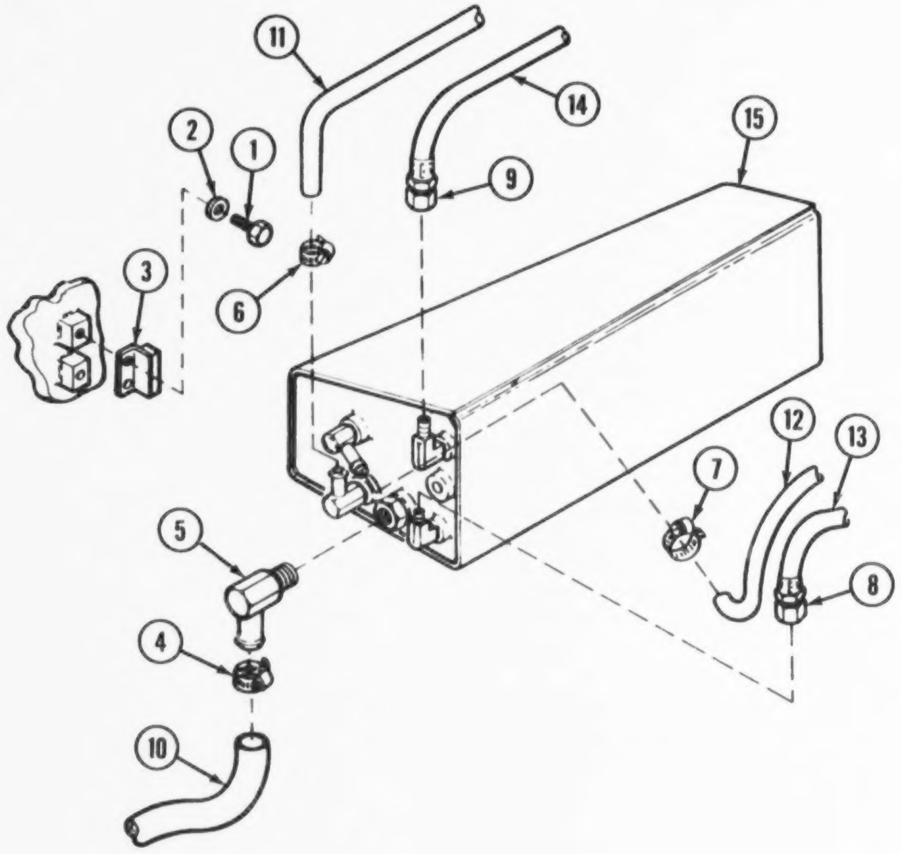
Personnel Required:

Two

Equipment Conditions:

Front slope plate removed (p 3-5).
Coolant system drained.





TA312773

SURGE TANK: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Remove two screws (1), two lockwashers (2) and retainer (3). Discard lockwashers.

B Loosen clamp (4) at elbow (5).

C Loosen two clamps (6 and 7).

D Unscrew two nuts (8 and 9).

E Disconnect five hoses (10, 11, 12, 13 and 14) from surge tank (15).

F Lift surge tank (15) up and out.

NOTE

Only remove pads that are defective and need to be replaced.

G Use putty knife to pry and scrape hull-mounted pads (16) from hull.

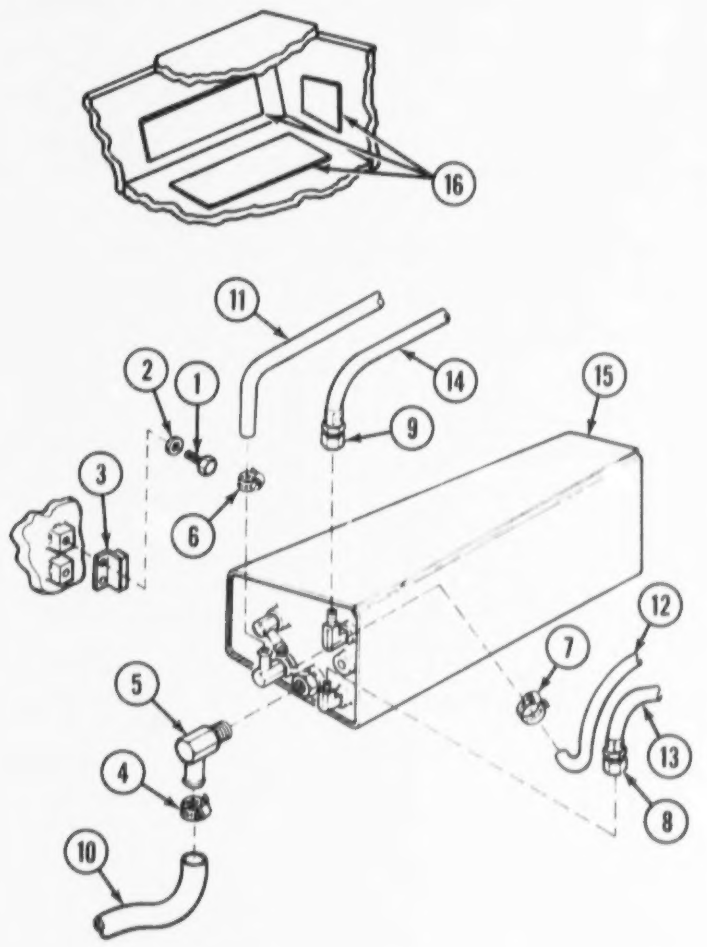
WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

H Use dry-cleaning solvent (item 19, Appx D), wire brush (item 48, Appx B) and rags to clean pad-mounting surface thoroughly. Remove all residue from old pad and adhesives.

TA312774

SURGE TANK: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Apply adhesive (item 1, Appx D) to new hull-mounted pads (16) and install in vehicle.

B Lower surge tank (15) into place.

C Connect five hoses (10, 11, 12, 13 and 14) on surge tank (15).

D Tighten two nuts (8 and 9).

E Tighten two clamps (6 and 7).

F Tighten clamp (4) at elbow (5).

G Install retainer (3) with two screws (1) and two new lockwashers (2).

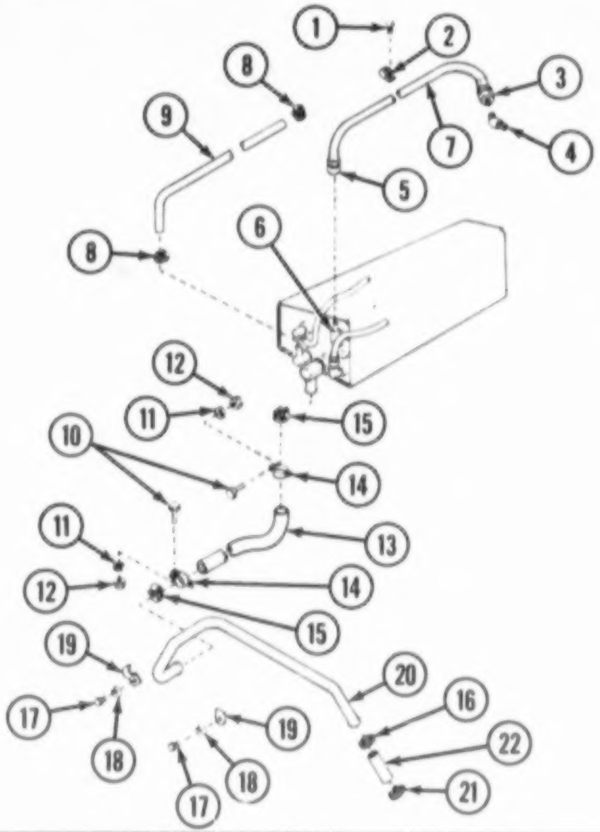
TA312775 ■

SURGE TANK HOSES AND FITTINGS: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Front slope plate removed (p 3-5).
Coolant system drained.



REMOVAL

A Remove screw (1) and clamp (2).

B Loosen swivel nut (3) at elbow (4) and swivel nut (5) at elbow (6). Remove hose (7).

C Loosen two hose clamps (8) and remove hose (9).

D Remove two screws (10), two lockwashers (11) and two nuts (12), securing hose (13) in two clamps (14). Discard lockwashers.

E Loosen two clamps (15) and remove hose (14).

F Loosen clamp (16).

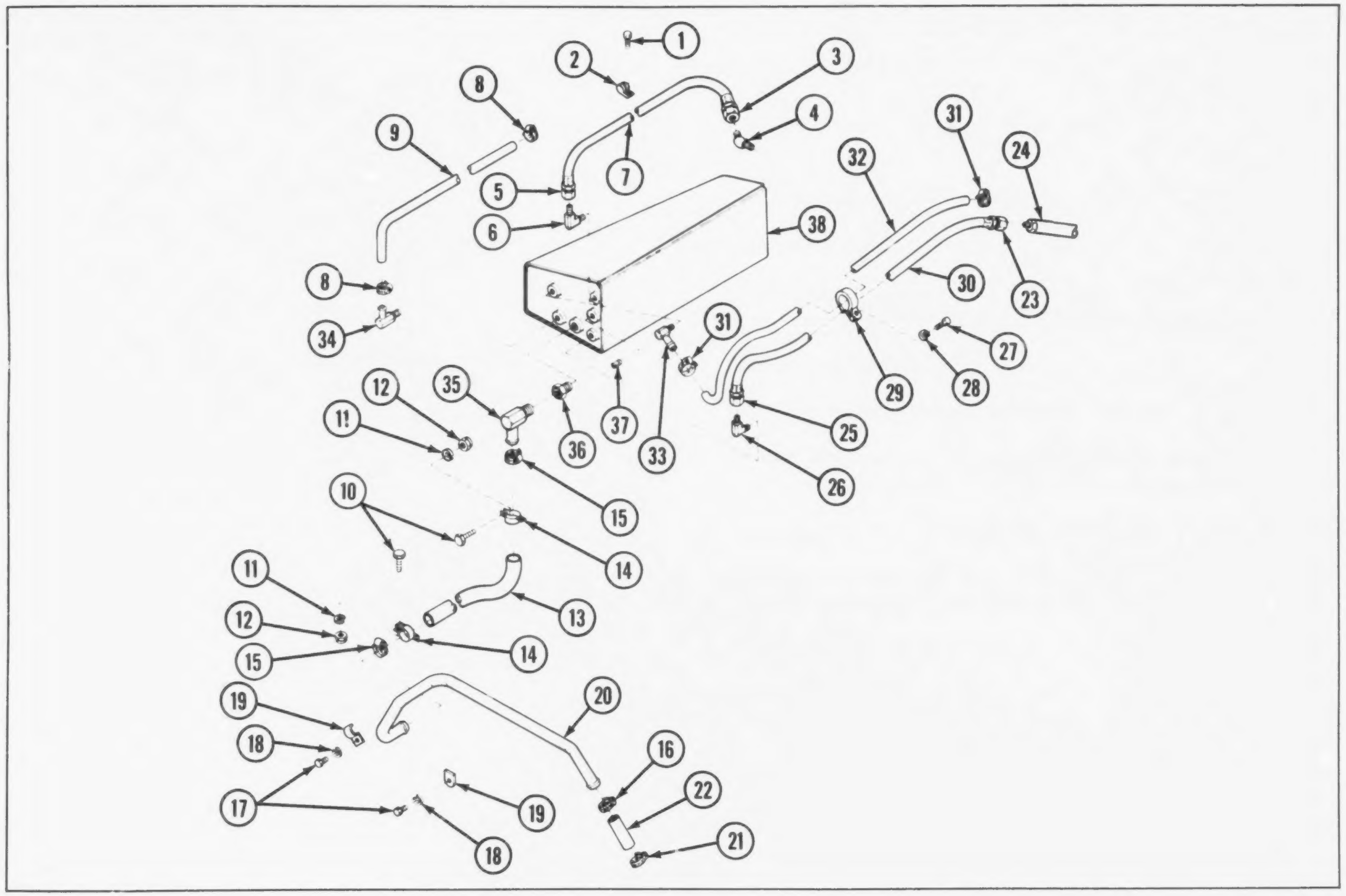
G Remove two screws (17), two lockwashers (18) and two clamps (19). Discard lockwashers.

H Remove tube (20).

I Loosen clamp (21) and remove tube (22).

TA312776

SURGE TANK HOSES AND FITTINGS: REMOVAL AND INSTALLATION (CONTINUED)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TA312777

SURGE TANK HOSES AND FITTINGS: REMOVAL AND INSTALLATION (CONTINUED)

J Loosen swivel nut (23) at crossover tube (24) and swivel nut (25) at elbow (26).

K Remove screw (27), lockwasher (28) and clamp (29). Discard lockwashers.

L Remove hose (30).

M Remove two clamps (31) and hose (32).

N Remove five elbows (6, 26, 33, 34 and 35), connector (36) and plug (37) from surge tank (38).

INSTALLATION

A Install plug (37), connector (36) and five elbows (35, 34, 33, 26 and 6) in surge tank (38).

B Install hose (32) and two clamps (31).

C Install hose (30) by tightening swivel nut (25) at elbow (26) and swivel nut (23) at crossover tube (24).

D Install clamp (29) with screw (27) and new lockwasher (28).

E Install tube (22) and tighten clamp (21).

F Install tube (20) and tighten clamp (16).

G Install two clamps (19) with two screws (17) and two new lockwashers (18).

H Install hose (13) and tighten two clamps (15).

I Secure two clamps (14) around hose (13) with two screws (10), two new lockwashers (11) and two nuts (12).

J Install hose (9) and tighten two hose clamps (8).

K Install hose (7) by tightening swivel nut (5) at elbow (6) and swivel nut (3) at elbow (4).

L Install clamp (2) with screw (1).

TA312778

PRESSURE RELIEF VALVE AND BLOCK MOUNT: REMOVAL AND INSTALLATION

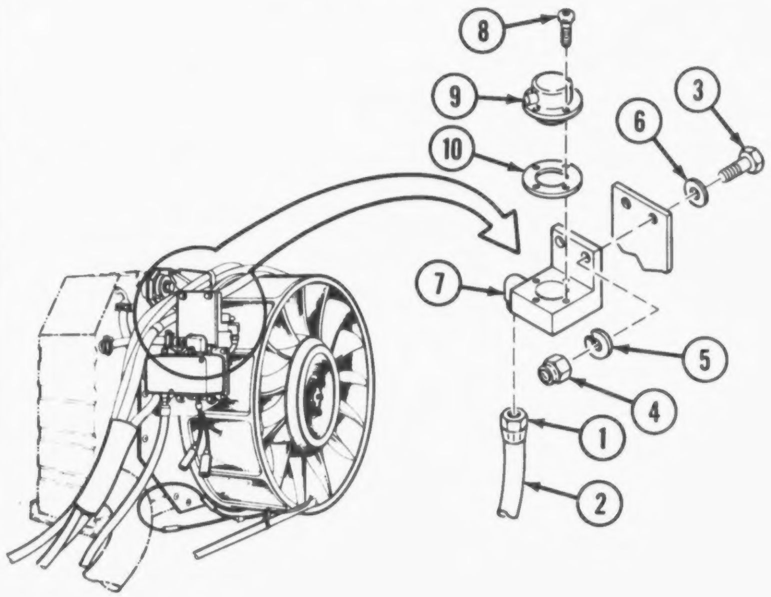
INITIAL SETUP

Equipment Condition:

Radiator fan protectors installed (p 2-5).
Front slope plate removed (p 3-5).

General Safety Instructions:

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when running engine in ground hop mode. Contact with rotating fan can cause injury.



REMOVAL

A Unscrew nut (1) on hose (2).

B Remove hose (2).

C Remove two screws (3), two nuts (4), two lockwashers (5), two flat washers (6) and block (7). Discard lockwashers.

D Remove four screws (8), relief valve (9) and gasket (10) from block (7). Discard gasket.

E Replace relief valve (9) if defective.

INSTALLATION

A Install new gasket (10) and relief valve (9) on block (7) with four screws (8).

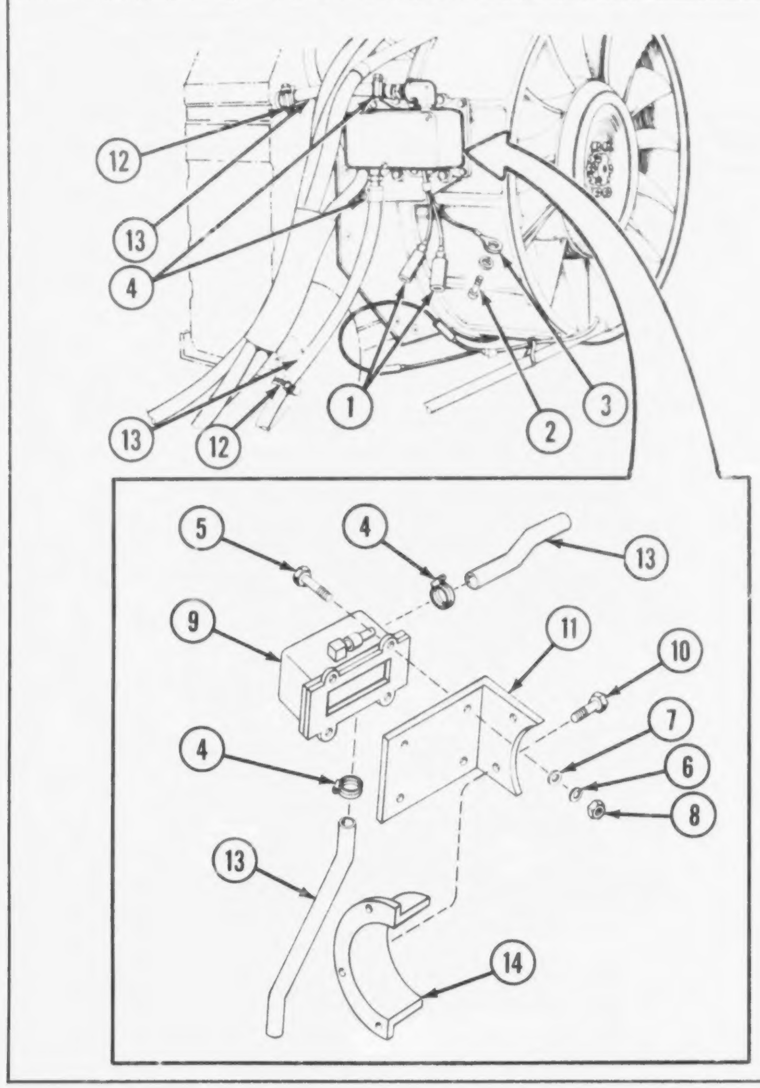
B Install block (7) with two screws (3), two new lockwashers (5), two flat washers (6) and two nuts (4).

C Install hose (2).

D Tighten nut (1).

TA57151

AERATION DETECTOR: REMOVAL AND INSTALLATION



REMOVAL

A Disconnect two electrical leads (1).

B Remove screw (2) and ground lead (3).

C Loosen two clamps (4).

D Remove four screws (5), four lockwashers (6), four flat washers (7) and four nuts (8).

E Remove aeration detector (9).

F Remove two screws (10) and bracket (11) from fan shroud (14).

G Loosen two clamps (12) if removal of hoses is required.

H Remove two hoses (13).

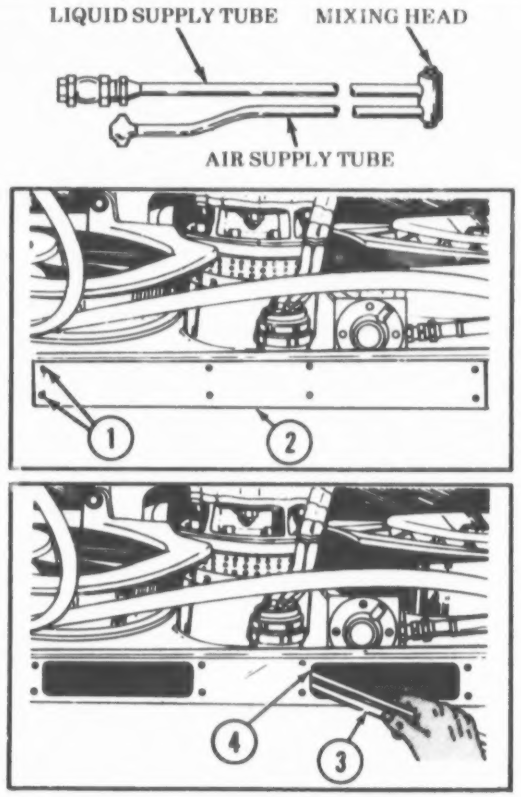
INSTALLATION

A Reverse removal procedures.

B Use adhesive (item 1, Appx D) at hose and tube interface(s).

TA310311

RADIATOR: CLEANING



The radiator cleaning tool (11641959) is designed to remove deposits of sand, oil, clay and other debris from the radiator cooling fins while installed in the vehicle. The cleaning agent may be a water solution of detergent and water, or nontoxic, nonflammable solvent and water. Mix one part of detergent or solvent to approximately five parts of water. A solution of detergent and water is recommended.

A Remove eight screws (1) and radiator shroud cover (2).

B Open hull drains (TM 9-2350-267-10).

C Cover all exposed openings of the engine.

D Connect radiator cleaning tool (3) to air supply and insert hose in container of solution.

E Insert cleaning tool through shroud cover opening (4). Saturate front and back of radiator with solution. Soak for approximately 10 minutes.

F Remove heavy deposits from face of radiator by brushing with medium stiff brush that will not damage the fins.

G Blast radiator exterior with air/liquid mixture, hold head of tool approximately 1/2 inch from face of radiator. Alternate from back to front until a good flow of liquid over the radiator fins is observed over entire area.

H Flush engine parts and exterior of radiator with clean water. Remove hose from container and use air to complete the operation.

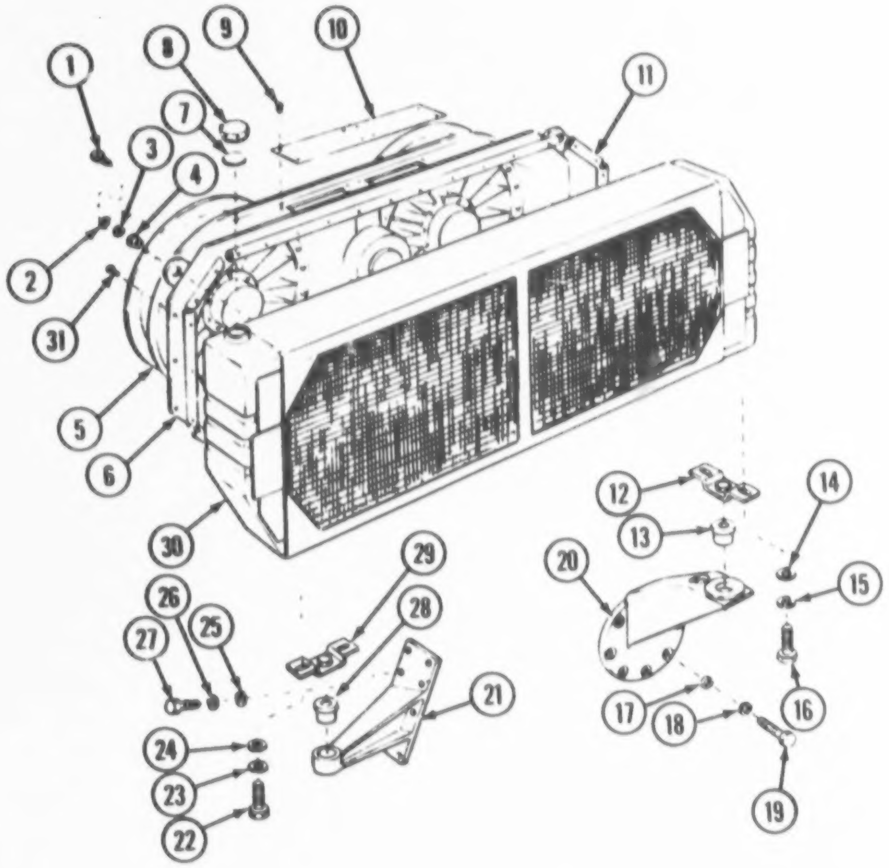
I Uncover engine openings. Install radiator shroud cover (2) with eight screws (1). Close hull drains.

NOTE

If overheating still occurs, notify Direct Support Maintenance.

TA310312

RADIATOR AND MOUNTS: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LEGEND

1 Bolt (2)
2 Lockwasher (2)
3 Flat washer (2)
4 Resilient mount (2)
5 Shroud
6 Seal w/strip (2)
7 Gasket
8 Cap
9 Screw (8)
10 Access cover
11 Seal (2) w/strip (6)
12 Bracket
13 Bushing
14 Flat washer (2)
15 Lockwasher (2)
16 Screw (2)
17 Flat washer (8)
18 Lockwasher (8)
19 Screw (8)
20 Mounting bracket
21 Mounting bracket
22 Screw (2)
23 Lockwasher (2)
24 Flat washer (2)
25 Flat washer (9)
26 Lockwasher (9)
27 Screw (9)
28 Bushing
29 Bracket
30 Radiator
31 Rivet (36)

TA312780

RADIATOR AND MOUNTS: REMOVAL AND INSTALLATION

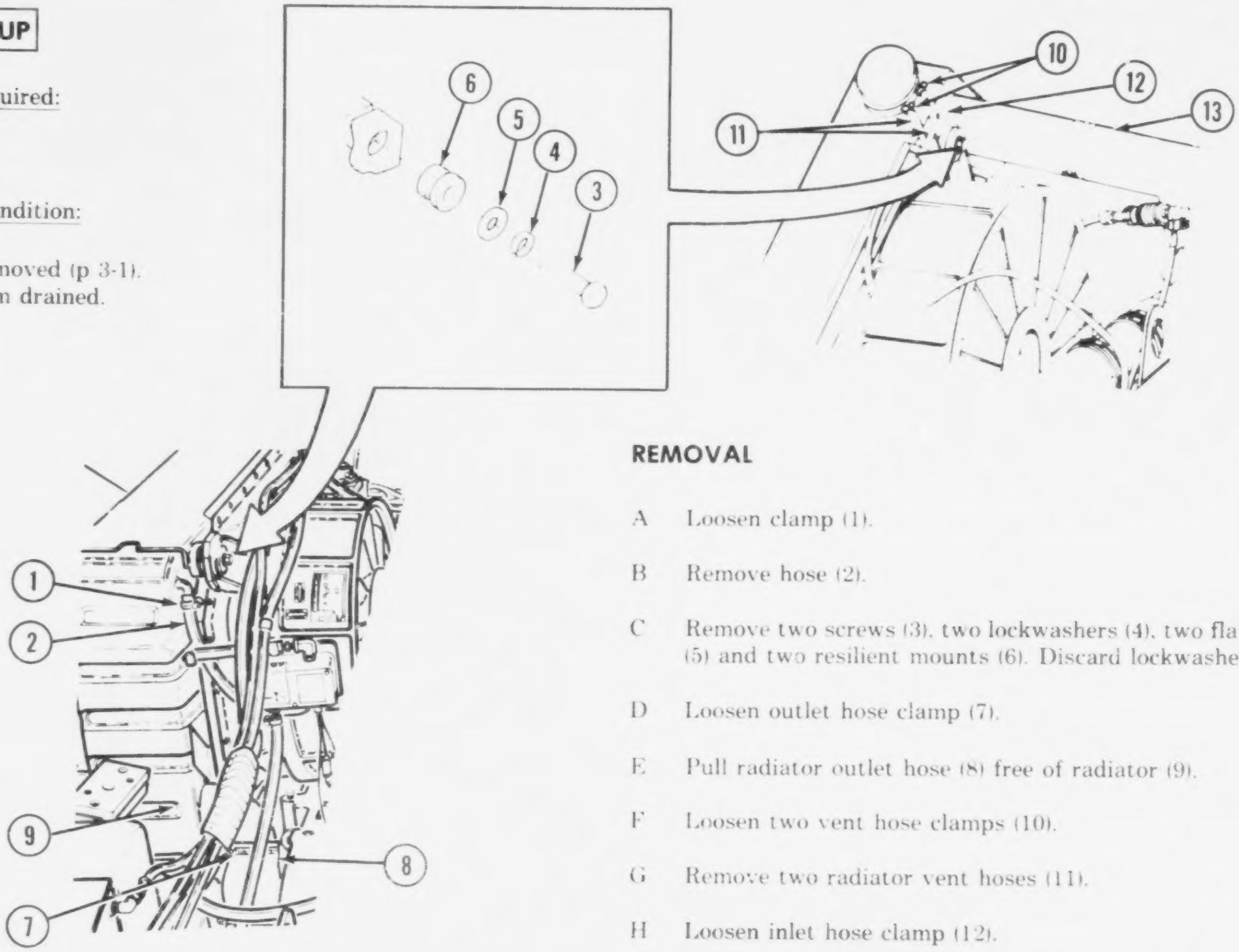
INITIAL SETUP

Personnel Required:

Two

Equipment Condition:

Powerpack removed (p 3-1).
Coolant system drained.



REMOVAL

A Loosen clamp (1).

B Remove hose (2).

C Remove two screws (3), two lockwashers (4), two flat washers (5) and two resilient mounts (6). Discard lockwashers.

D Loosen outlet hose clamp (7).

E Pull radiator outlet hose (8) free of radiator (9).

F Loosen two vent hose clamps (10).

G Remove two radiator vent hoses (11).

H Loosen inlet hose clamp (12).

I Pull radiator inlet hose (13) free of radiator (9).

TA312781

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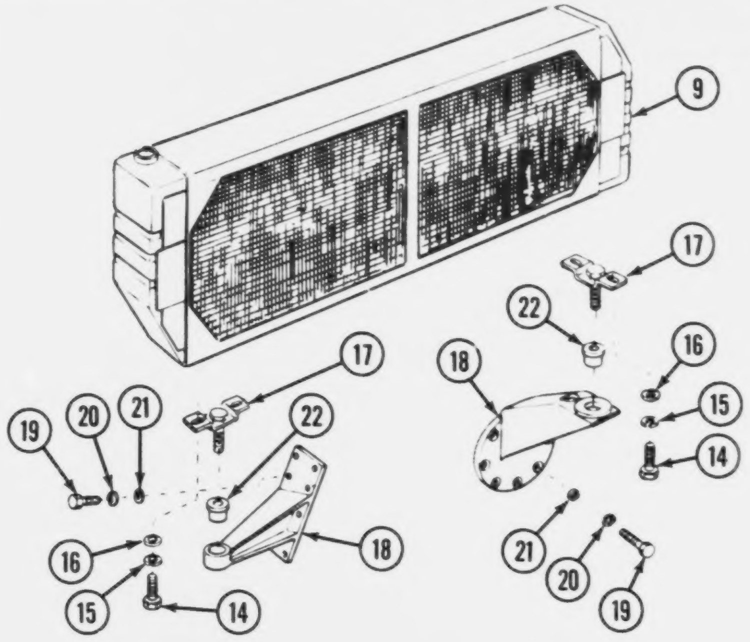
RADIATOR AND MOUNTS: REMOVAL AND INSTALLATION (CONTINUED)



WARNING

Perform step J using two people to prevent injury to personnel.

J Lift radiator (9) up and away from shroud.

K Remove four screws (14), four lockwashers (15), four flat washers (16) and two brackets (17) from bottom of radiator (9). Discard lockwashers.

L Remove two mounts (18) from transfer assembly by removing eight screws (19), eight lockwashers (20) and eight flat washers (21) from each mount.

M Remove bushing (22) from each mount (18). Discard bushings.

INSTALLATION

A Install new bushing (22) in each mount (18).

B Install two mounts (18) on transfer assembly with eight screws (19), eight new lockwashers (20) and eight flat washers (21) for each mount (18).

C Install two brackets (17) on bottom of radiator (9) with four screws (14), four new lockwashers (15) and four flat washers (16).

WARNING

Perform step D using two people to prevent injury to personnel.

D Lift radiator (9) into place against shroud.

E Attach radiator inlet hose (13) to radiator (9).

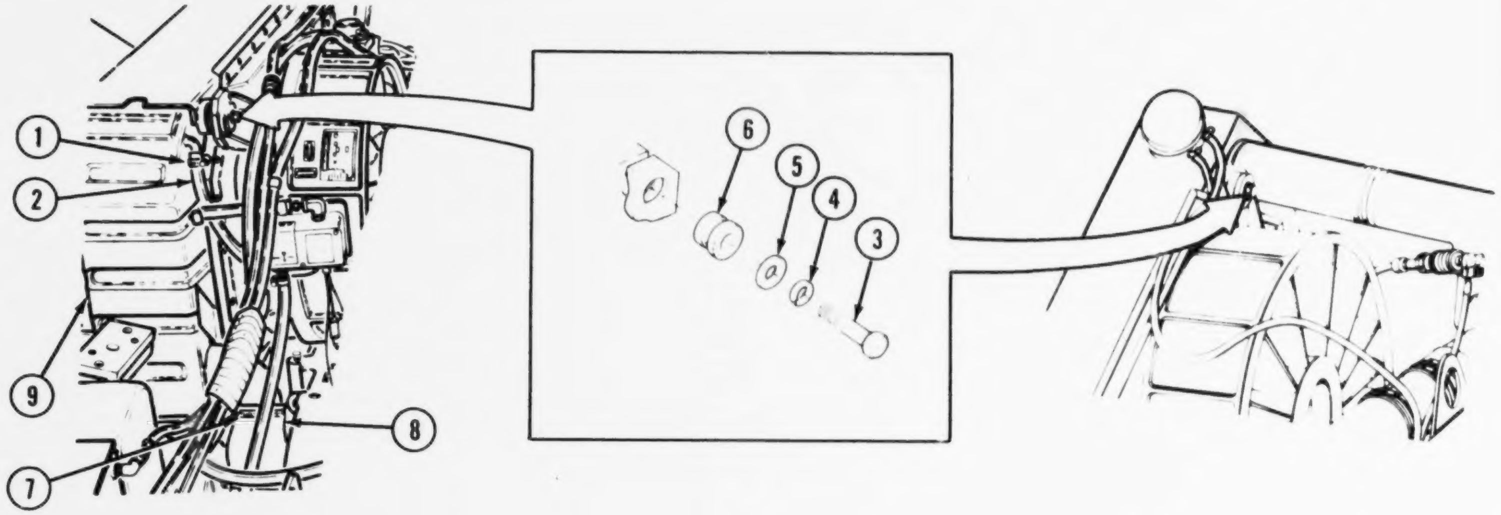
F Tighten inlet hose clamp (12).

G Install two radiator vent hoses (11).

H Tighten two vent hose clamps (10).

TA312782

RADIATOR AND MOUNTS: REMOVAL AND INSTALLATION (CONTINUED)



I Attach radiator outlet hose (8) to radiator (9).

J Tighten outlet hose clamp (7).

K Install two resilient mounts (6) with two screws (3), two new lockwashers (4) and two flat washers (5).

L Install hose (2).

M Tighten clamp (1).

TA312783

INLET THERMOSTAT AND HOUSING ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

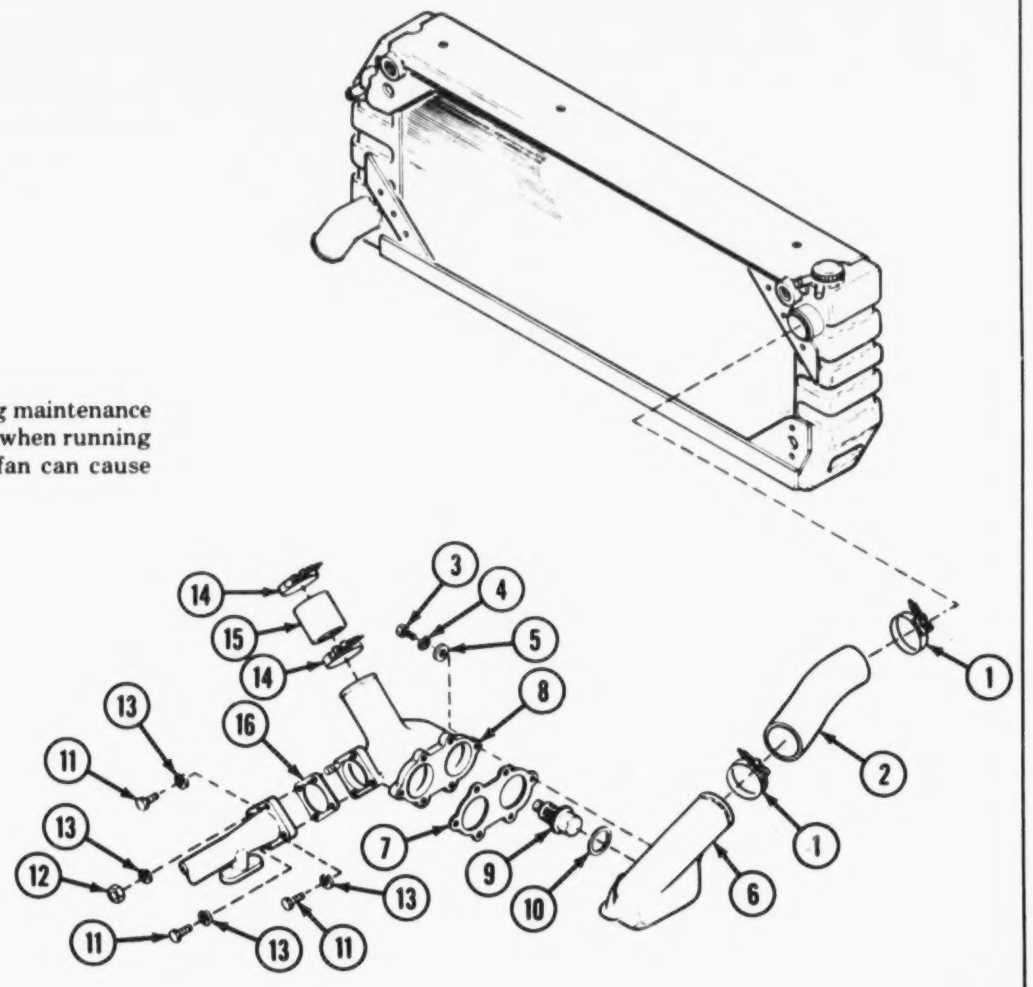
Handle, installer (item 36, Appx B)
Installer, seal (item 37, Appx B)

Equipment Condition:

Radiator fan protectors installed (p 2-5).
Front slope plate removed (p 3-5).

General Safety Instructions:

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when running engine in ground hop mode. Contact with rotating fan can cause injury.



TA57158

INLET THERMOSTAT AND HOUSING ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Open and secure air intake grille.

B Loosen two clamps (1).

C Remove tube (2).

D Remove six screws (3), six lockwashers (4) and six flat washers (5). Discard lockwashers.

E Remove inlet housing (6) and gasket (7) from manifold coolant connector (8). Discard gasket.

F Remove two thermostats (9) and two seals (10). Discard seals.

G Remove three screws (11), nut (12) and four lockwashers (13) at manifold coolant connector (8). Discard lockwashers.

H Loosen two clamps (14) and remove hose (15).

I Remove manifold coolant connector (8) and gasket (16). Discard gasket.

INSTALLATION

A Install new gasket (16) and manifold coolant connector (8).

B Install hose (15) and tighten two clamps (14).

C Install three screws (11), nut (12) and four new lockwashers (13) at manifold coolant connector (8).

D Using seal installer (item 37, Appx B) and handle (item 36, Appx B), install two new seals (10) into inlet housing (6) with leather surface facing outward.

E Install two thermostats (9).

F Install new gasket (7) and inlet housing (6) on manifold coolant connector (8).

G Install six screws (3), six new lockwashers (4) and six flat washers (5).

H Install tube (2).

I Tighten two clamps (1).

J Close and secure air intake grille.

TA312785

BYPASS THERMOSTAT AND HOUSING ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Radiator fan protectors installed (p 2-5).
Front slope plate removed (p 3-5).

General Safety Instructions:

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when running engine in ground hop mode. Contact with rotating fan can cause injury.

REMOVAL

A Loosen two clamps (1) at cross-over tube connector (2).

B Remove four screws (3), four lockwashers (4) and gasket (5) at engine coolant manifold (6). Discard gasket.

C Loosen upper clamp (7).

D Remove manifold connector (8).

E Loosen lower clamps (7).

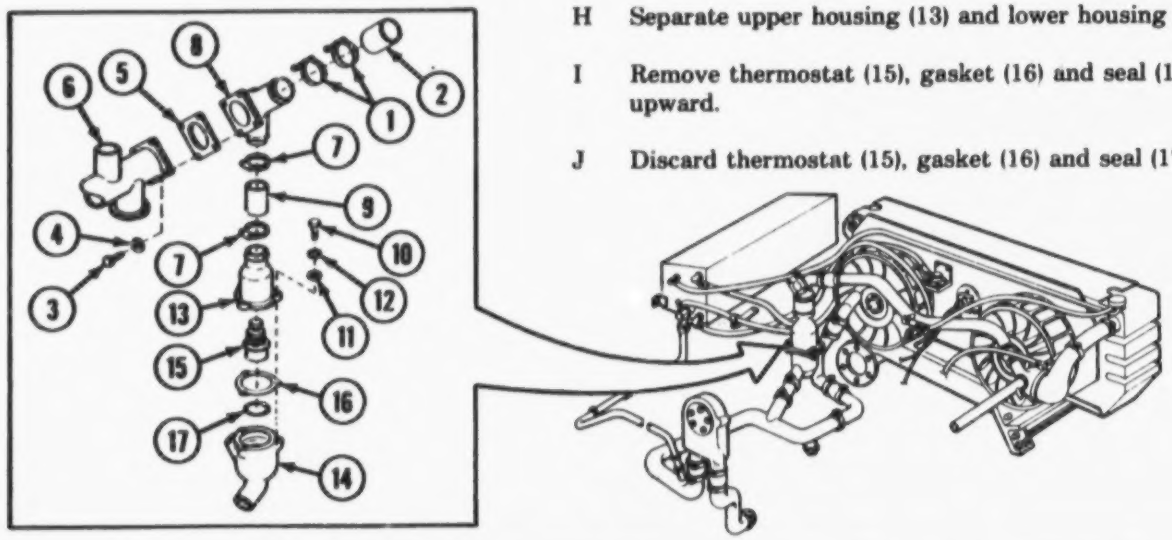
F Remove coolant hose (9).

G Remove three screws (10), three flat washers (11) and three lockwashers (12).

H Separate upper housing (13) and lower housing (14).

I Remove thermostat (15), gasket (16) and seal (17) by pulling upward.

J Discard thermostat (15), gasket (16) and seal (17).



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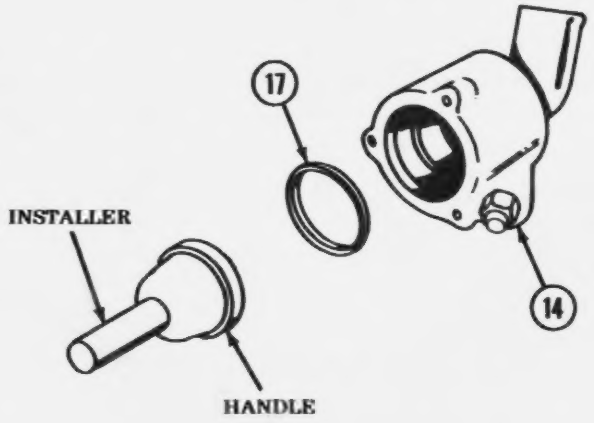


INSTALLATION

A Reverse removal procedures.

B Install seal (17) in lower housing (14) using installer and handle.

C Replace gaskets (5 and 16).

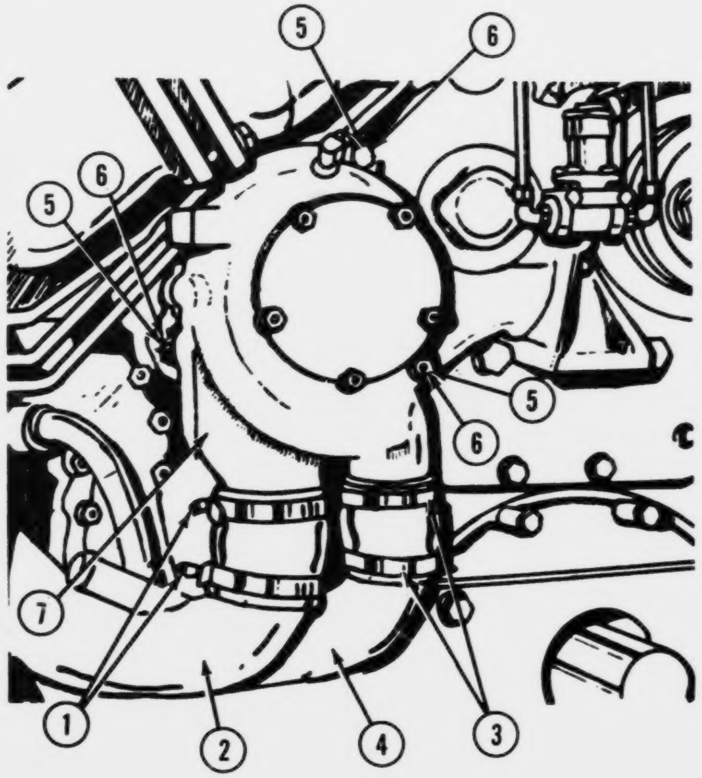
D Replace thermostat (15).

E Apply adhesive (item 1, Appx D) at connections of all mating surfaces.

F Refill radiator (TM 9-2350-267-10).

TA310319

COOLANT PUMP: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerpack (p 3-1).

B Drain coolant system (TM 9-2350-267-10).

C Loosen two clamps (1) on inlet hose (2).

D Loosen two clamps (3) on outlet hose (4).

E Remove three screws (5) and three lockwashers (6).

F Remove coolant pump (7) and gasket (8). Discard gasket (8).

NOTE

Gasket (8) between pump (7) and engine not shown.

INSTALLATION

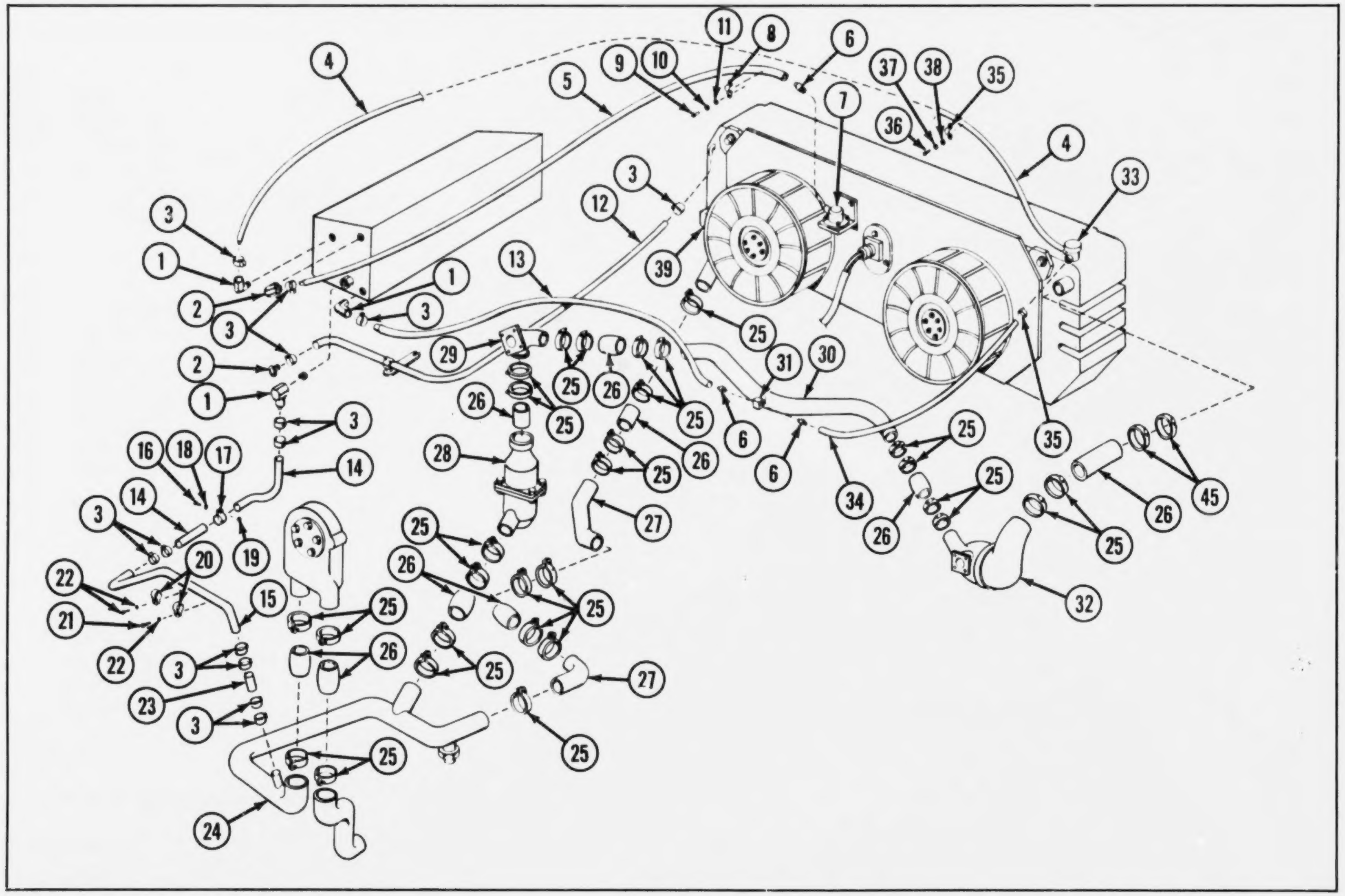
A Reverse removal procedures.

B Install new gasket (8).

C Apply adhesive (item 1, Appx D) to ends of tubes and hoses.

D Refill radiator (TM 9-2350-267-10).

TA310320



TA310321

HOSES AND TUBES: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

Remove in sequence of illustration.

LEGEND

1 Elbow (3)
2 Elbow (2)
3 Adjustable clamp (13)
4 Hose, surge tank-to-radiator vent
5 Hose, surge tank-to-relief valve
6 Adapter (3)
7 Pressure relief valve
8 Clamp
9 Screw
10 Flat washer
11 Lockwasher
12 Hose, surge tank-to-radiator
13 Hose, surge tank-to-bypass tube
14 Hose, surge tank-to-tube 12 (to main tube)
15 Tube, hose 12-to-hose 19 (to main tube)
16 Screw
17 Clamp
18 Lockwasher
19 Nut
20 Clamp (2)
21 Screw
22 Lockwasher
23 Hose, tube 13-to-main tube
24 Main tube
25 Clamp (33)
26 Connector hose (9)
27 Engine coolant lower tube
28 Outlet thermostat housing assembly
29 Engine coolant manifold connector housing
30 Bypass tube
31 T-connector bypass tube
32 Inlet thermostat housing assembly
33 Radiator filler tube with two vents
34 Hose, radiator vent-to-bypass tube
35 Clamp (2)
36 Screw
37 Flat washer
38 Lockwasher (2)
39 Aeration detector assembly tubing

INSTALLATION

A Reverse removal procedures.

B Apply adhesive (item 1, Appx D) to ends of tubes and hoses before assembly.

C Replace gaskets at inlet and outlet thermostat assemblies if engine coolant manifolds are disconnected.

D Torque all tube/hose connector clamps to 40-60 lb-in.

E Install power plant (p 3-1) and refill radiator (22 gal) with coolant (TM 9-2350-267-10).

TA310322

CHAPTER 6
MAINTENANCE PROCEDURES
ELECTRICAL SYSTEMS / CIRCUITS

CHAPTER OVERVIEW

This chapter illustrates and describes removal and installation of powerpack and hull electrical systems and components. Procedures are also included for disassembly, assembly, checks and adjustments of components, as authorized by the MAC for organizational maintenance.

Section I Powerpack Electrical System
Section II Hull Electrical Systems
Section III Powerpack and Hull Wiring Harnesses

Disassemble components only to the extent required to correct a malfunction or defect. Replace only those parts necessary to correct the malfunction. Install the mandatory replacement parts at that point.

TA311032

Section I POWERPACK ELECTRICAL SYSTEM

GENERAL INSPECTION AND REPAIR PROCEDURES

The technician will conduct a visual inspection of electrical components and wiring harnesses during removal and disassembly to determine serviceability or repair/replace status of the items. During inspection, look for the following conditions and take actions as indicated:

- Cracked, torn or deteriorated wire/cable insulation.

  Replace or repair individual harness leads where practical. Replace entire harness if necessary.

- Broken, cracked or damaged connectors (ie, missing pins).

  Repair where practical. Replace connector if necessary.

- Burned or discolored connectors or components.

  Troubleshoot electrical circuitry to correct problem. Repair or replace components, circuit leads, harnesses and connectors as necessary.

- Cracked, broken or damaged electrical component housings.

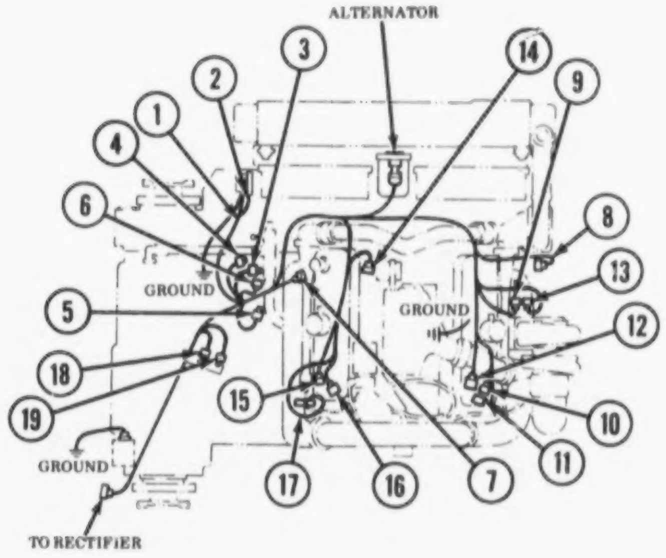
  Repair where practical. If necessary, replace components such as master relay, generator, rectifier, voltage regulator and solenoids.

TA311033

POWERPACK ELECTRICAL SYSTEM

Connector Number	Electrical Lead To:	Wire No.
1	Aeration detector	352A
2	Aeration detector	352B
3	Transmission oil temperature transmitter	324
4	Transmission oil high temperature switch	509D
5	Transmission oil low pressure switch	509C
6	Transmission oil pressure transmitter	321
7	Engine coolant high temperature switch	509A
8	Engine coolant temperature transmitter	33A
9	Starter motor solenoid from starter relay	14B
10	Engine oil low pressure switch	509B

Connector Number	Electrical Lead To:	Wire No.
11	Air cleaner blower motor switch	415
12	Engine oil pressure transmitter	36
13	Starter motor solenoid from master relay	82
14	Flame heater ignition coil	486
15	Flame heater air pump	486
16	Flame heater solenoid	486A
17	Fuel prime pump	588
18	Master circuit harness	12268102
19	Starter cable connector	82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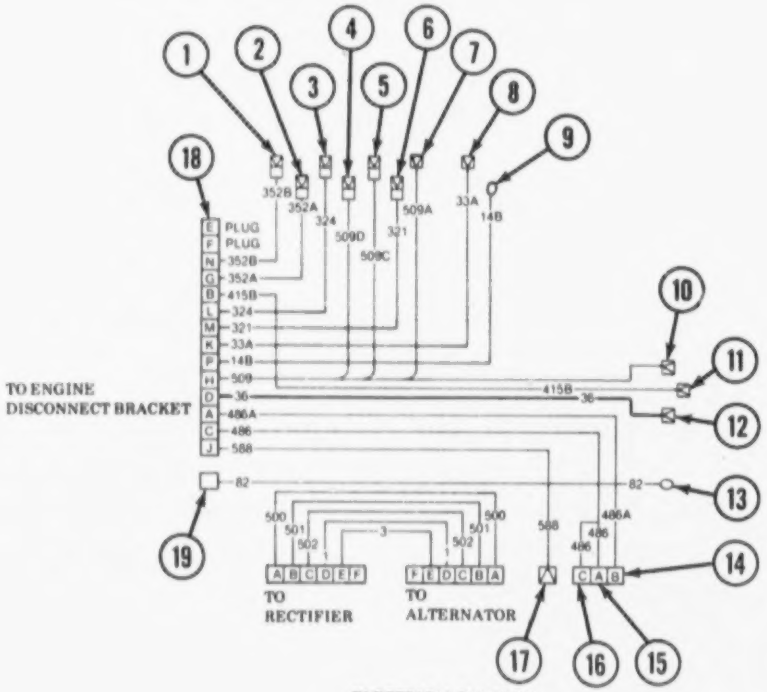
GROUND
GROUND
GROUND
TO RECTIFIER

PICTORIAL VIEW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509D
509C
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509A
33A
14B
E PLUG
F PLUG
N 352B
G 352A
B 415B
L 324
M 321
K 33A
P 14B
H 509
D 36
A 486A
C 486
J 588
82
TO ENGINE DISCONNECT BRACKET
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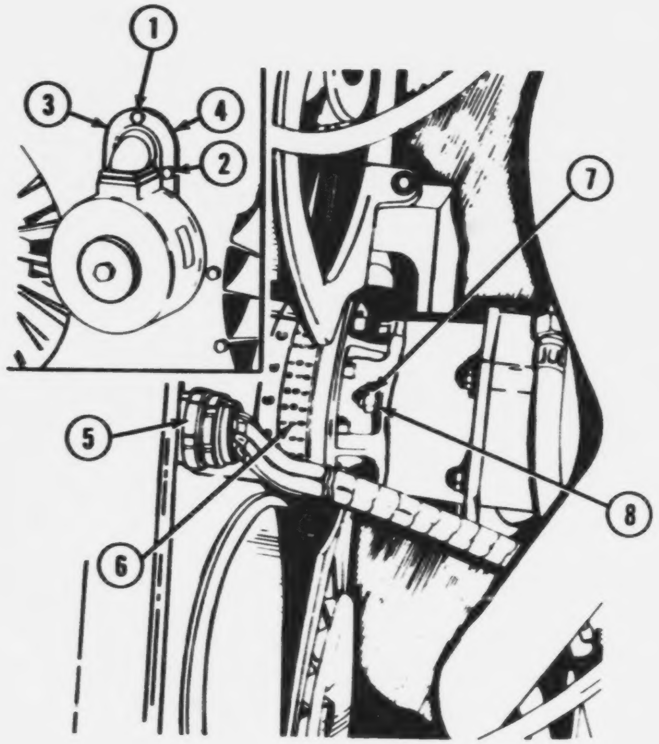
C A B
TO RECTIFIER
TO ALTERNATOR

ELECTRICAL DIAGRAM

TA311034

GENERATOR (ALTERNATOR): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Set MASTER switch OFF. Disconnect battery ground cables.

A Remove powerpack from vehicle (p 3-1).

B Remove radiator from powerpack (p 5-21).

C Remove three screws (1), three nuts (2), retainer (3) and gasket (4) from inside shroud assembly.

D Disconnect alternator-to-rectifier wiring harness (5) at alternator (6).

E Remove six mounting nuts (7) and six lockwashers (8).

WARNING

Weight of alternator is 85 lb. Grip firmly when removing.

F Remove alternator (6).

TA311035

GENERATOR (ALTERNATOR): REMOVAL AND INSTALLATION (CONTINUED)

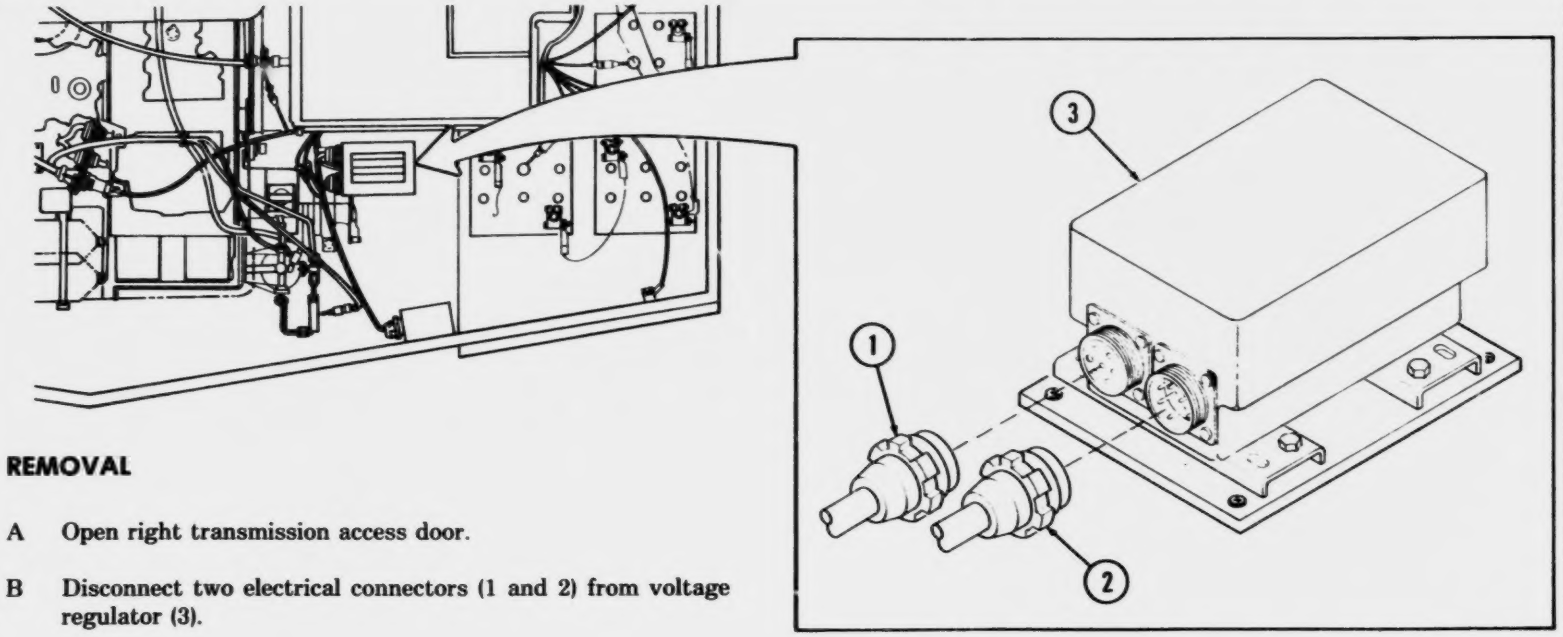
INSTALLATION

A Operate engine out of hull and check alternator operation before installing powerpack (p 3-27).

B Install powerpack in vehicle (p 3-26).

C Reverse removal procedures.

VOLTAGE REGULATOR, BILGE PUMP RELAY, STARTER RELAY, CIRCUIT BREAKER AND MOUNTING BRACKETS: REMOVAL AND INSTALLATION



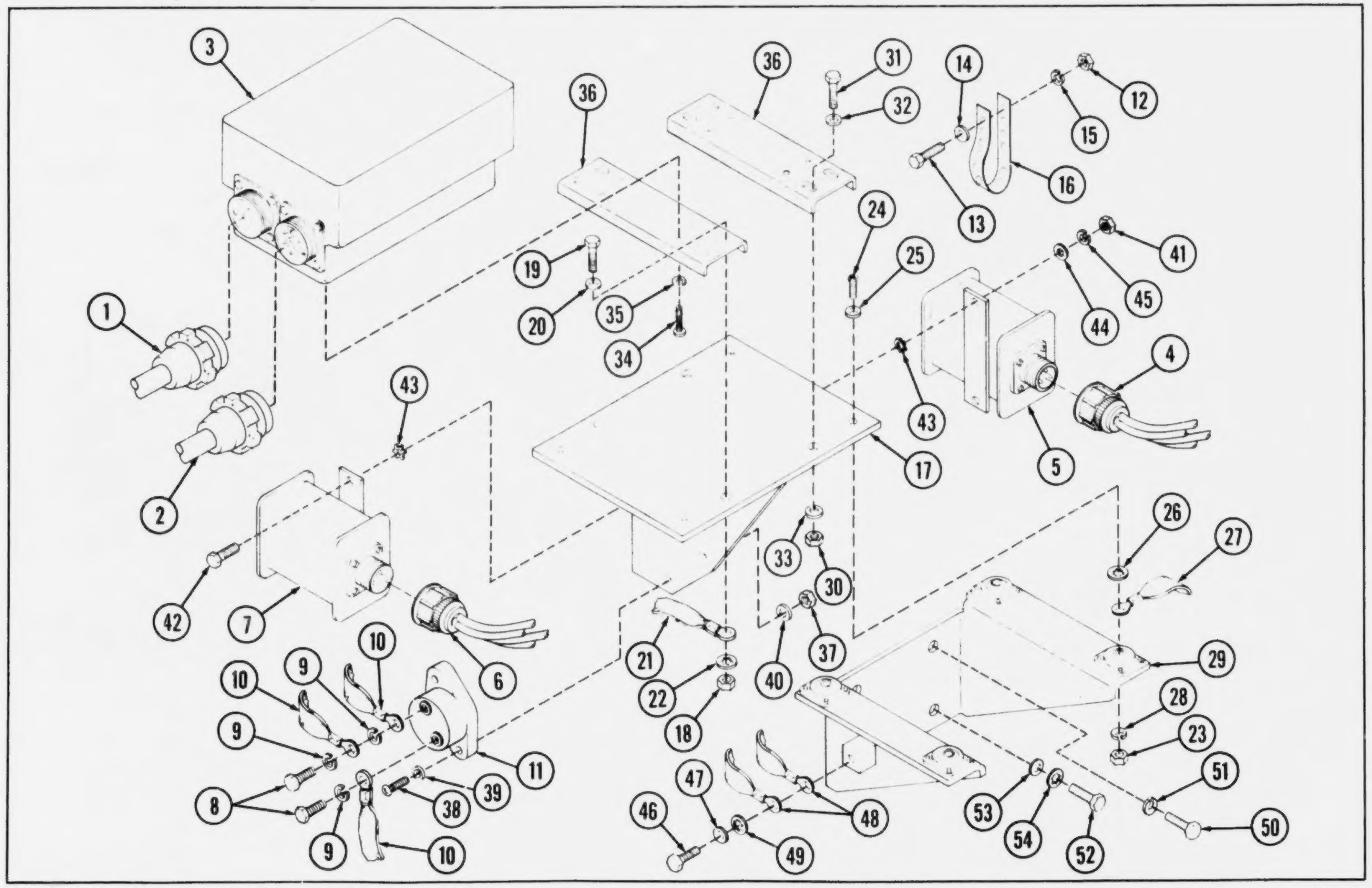
REMOVAL

A Open right transmission access door.

B Disconnect two electrical connectors (1 and 2) from voltage regulator (3).

TA312786

VOLTAGE REGULATOR, BILGE PUMP RELAY, STARTER RELAY, CIRCUIT BREAKER AND MOUNTING BRACKETS: REMOVAL AND INSTALLATION (CONTINUED)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TA312787

VOLTAGE REGULATOR, BILGE PUMP RELAY, STARTER RELAY, CIRCUIT BREAKER AND MOUNTING BRACKETS: REMOVAL AND INSTALLATION (CONTINUED)

C Disconnect electrical connector (4) from starter relay (5).

D Disconnect electrical connector (6) from bilge pump relay (7).

E Remove two screws (8), three lockwashers (9) and three electrical leads (10) from circuit breaker (11). Discard lockwashers.

F Remove nut (12), screw (13), flat washer (14), lockwasher (15) and strap (16) from mounting bracket (17). Discard lockwasher.

G Remove nut (18), screw (19), flat washer (20), ground lead (21) and lockwasher (22). Discard lockwasher.

H Remove four nuts (23), four screws (24), four flat washers (25), one lockwasher (26), one ground lead (27) and four lockwashers (28). Discard lockwashers.

I Remove mounting bracket (17), voltage regulator (3), starter relay (5), bilge pump relay (7) and circuit breaker (11) as an assembly from support assembly (29).

J Remove three nuts (30), three screws (31), three flat washers (32), three lockwashers (33) and voltage regulator (3) from mounting bracket (17). Discard lockwashers.

K Remove four screws (34), four lockwashers (35) and two mounting brackets (36) from voltage regulator (3). Discard lockwashers.

L Remove two nuts (37), two screws (38), two flat washers (39), two lockwashers (40) and circuit breaker (11) from mounting bracket (17). Discard lockwashers.

M Remove two nuts (41), two screws (42), four lockwashers (43), two flat washers (44), two lockwashers (45), starter relay (5) and bilge pump relay (7) from mounting bracket (17). Discard lockwashers.

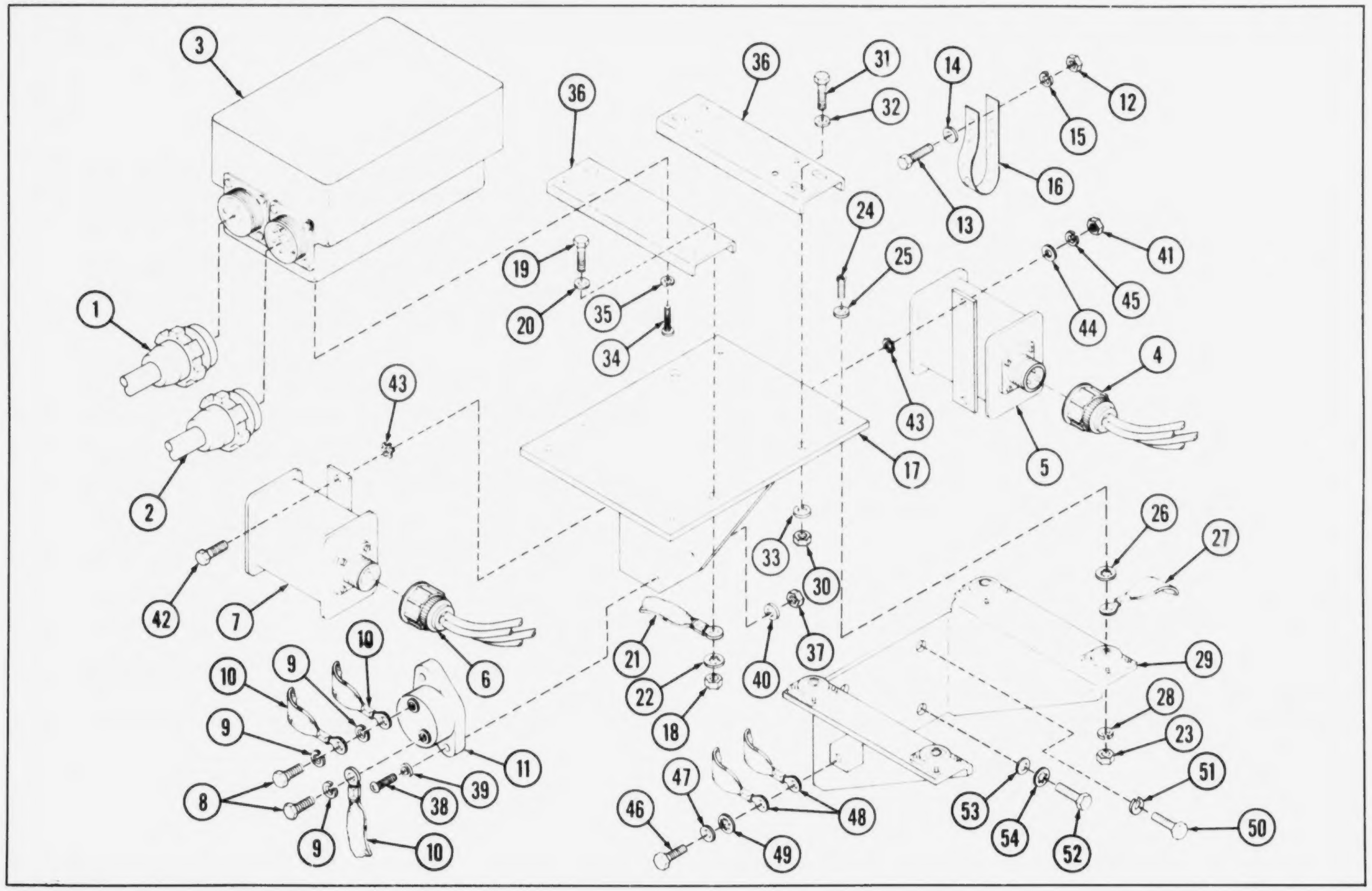
N Remove screw (46), flat washers (47), two ground leads (48) and lockwasher (49) from support assembly (29). Discard lockwashers.

O Remove two screws (50) and two lockwashers (51) from top of support assembly (29). Discard lockwashers.

P Remove two screws (52), two flat washers (53) and two lockwashers (54) and remove support assembly (29) from vehicle hull. Discard lockwashers.

TA312788

VOLTAGE REGULATOR, BILGE PUMP RELAY, STARTER RELAY, CIRCUIT BREAKER AND MOUNTING BRACKETS: REMOVAL AND INSTALLATION (CONTINUED)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TA312789

VOLTAGE REGULATOR, BILGE PUMP RELAY, STARTER RELAY, CIRCUIT BREAKER AND MOUNTING BRACKETS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Install support assembly (29) on vehicle hull with two screws (52), two flat washers (53) and two new lockwashers (54).

B Install two screws (50) and two new lockwashers (51) in top of support assembly (29).

C Install screw (46), flat washer (47), two ground leads (48) and new lockwasher (49) on support assembly (29).

D Install starter relay (5) and bilge pump relay (7) on mounting bracket (17) with two screws (42), four new lockwashers (43), two flat washers (44), two new lockwashers (45) and two nuts (41).

E Install circuit breaker (11) on mounting bracket (17) with two screws (38), two flat washers (39), two new lockwashers (40) and two nuts (37).

F Install two mounting brackets (36) on voltage regulator (3) with four screws (34) and four new lockwashers (35).

G Install voltage regulator (3) on mounting bracket (17) with three screws (31), three flat washers (32), three new lockwashers (33) and three nuts (30).

H Install mounting bracket (17), voltage regulator (3), starter relay (5), bilge pump relay (7) and circuit breaker (11) as an assembly on support assembly (29).

I Install four screws (24), four flat washers (25), one new lockwasher (26), one ground lead (27), four new lockwashers (28) and four nuts (23).

J Install screw (19), flat washers (20), ground lead (21), new lockwasher (22) and nut (18).

K Install strap (16) on mounting bracket (17) with screw (13), flat washer (14), new lockwasher (15) and nut (12).

L Install three electrical leads (10) on circuit breaker (11) with two screws (8) and three new lockwashers (9).

M Connect electrical connector (6) to bilge pump relay (7).

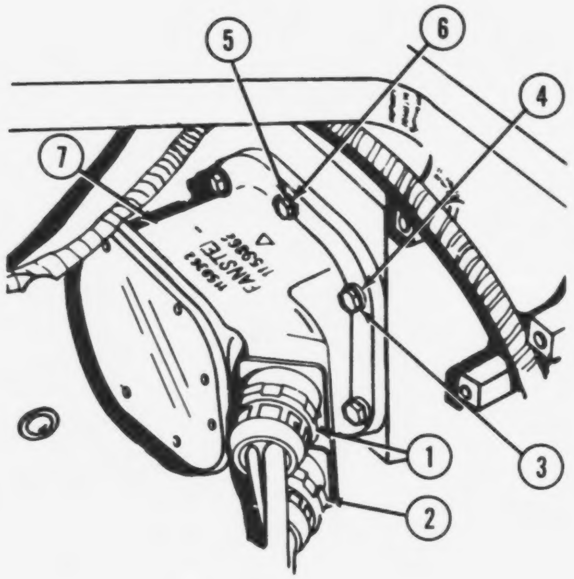
N Connect electrical connector (4) to starter relay (5).

O Connect two electrical connectors (1 and 2) to voltage regulator (3).

P Close right transmission access door.

TA312790

RECTIFIER: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cable.

A Disconnect wiring harnesses (1 and 2).

B Remove four screws (3) and four flat washers (4).

C Remove two brass screws (5) and two lockwashers (6).

D Remove rectifier (7).

E Scrape packing from groove of rectifier base.

INSTALLATION

A Coat packing groove with silicone compound (item 58, Appx D), and fill groove with packing.

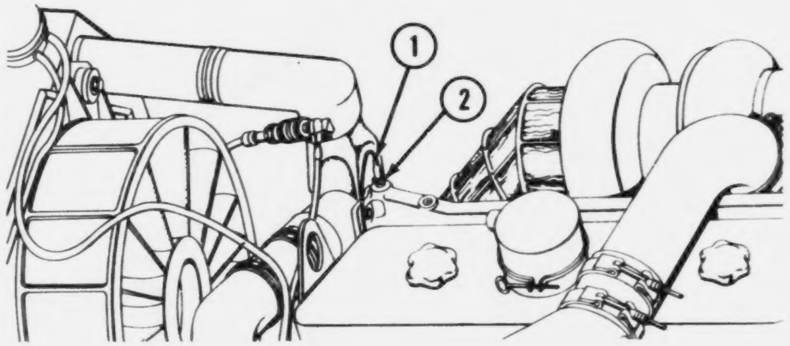
B Install rectifier (7) and secure with two brass screws (5) and two lockwashers (6). Torque screws to 16 lb-ft.

C Install four flat washers (4) and screws (3). Torque to 30 lb-ft.

D Connect wiring harnesses (1 and 2).

TA311038

ENGINE COOLANT TEMPERATURE TRANSMITTER: REMOVAL AND INSTALLATION



NOTE

Working temperature range of this transmitter is +120° to +280°F.

REMOVAL

WARNING

Engine must be cool before removing transmitter. Removal of transmitter from hot engine will allow hot coolant to spurt from transmitter receptacle, possibly causing severe burns.

A Open powerpack air intake door and lock in position.

B Disconnect lead 33A electrical connector (1).

NOTE

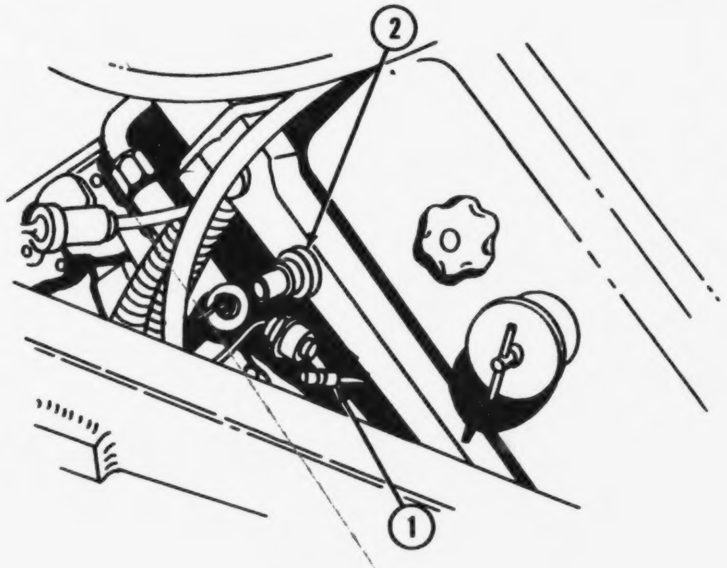
Cooling system coolant will drain from opening when transmitter is removed. Install replacement transmitter immediately.

C Unscrew and remove temperature transmitter (2).

INSTALLATION

Reverse removal procedures.

TA311039



REMOVAL

WARNING

Engine must be cool before removing switch. Removal of switch from hot engine will allow hot coolant to spurt from switch receptacle, possibly causing severe burns.

NOTE

Working temperature range of this switch is +218° to +232°F.

A Open powerpack air intake door and lock in position (p

B Disconnect 509A electrical connector (1).

NOTE

When switch is removed, coolant will drain through switch mounting opening. Replacement switch should be installed immediately to prevent loss of coolant.

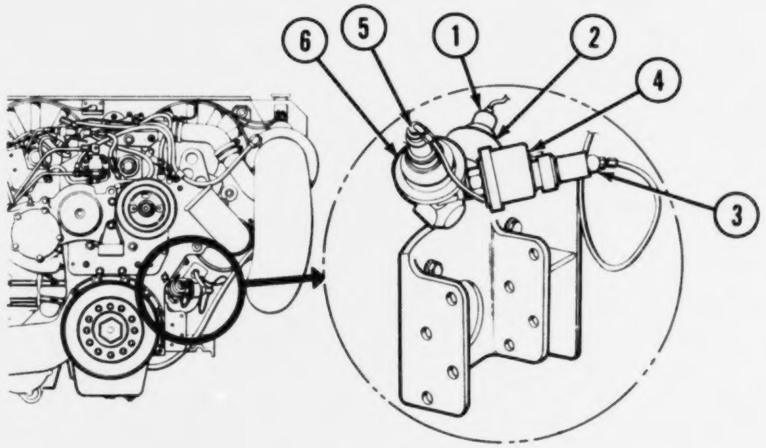
C Unscrew and remove engine coolant high temperature switch (2).

INSTALLATION

Reverse removal procedures.

TA311040

ENGINE OIL PRESSURE TRANSMITTER, ENGINE OIL LOW PRESSURE SWITCH AND AIR CLEANER BLOWER MOTOR SWITCH: REMOVAL AND INSTALLATION



REMOVAL

A Remove engine compartment access cover (p 3-14).

B Disconnect wire 36 electrical connector (1).

C Unscrew and remove engine oil pressure transmitter (2).

D Disconnect wire 509B electrical connector (3).

E Unscrew and remove engine oil low pressure switch (4).

NOTE

Oil pressure switch energizes air cleaner blower motor relay and generator system relay.

F Disconnect wire 415B electrical connector (5).

G Unscrew and remove air cleaner blower motor switch (6).

INSTALLATION

NOTE

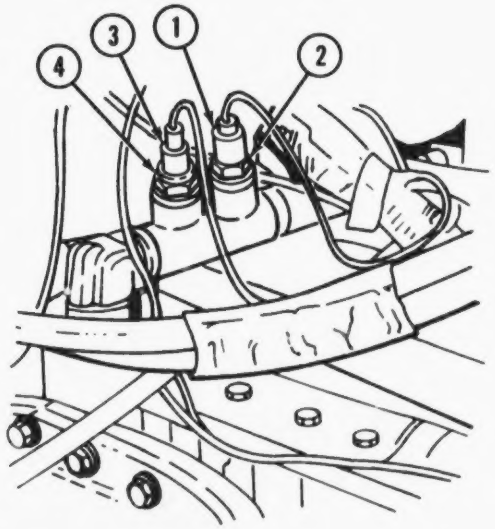
The operating pressure range for each part is as follows:

Engine oil pressure transmitter — 0-120 psi
Engine oil low pressure switch — 15-19 psi
Air cleaner blower motor switch — 9-13 psi

Reverse removal procedures.

TA311041

TRANSMISSION OIL TEMPERATURE TRANSMITTER AND OIL HIGH TEMPERATURE SWITCH: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Make sure engine has cooled before removing switches.

A Open and secure right transmission door.

B Disconnect wire 324 electrical connector (1).

C Unscrew and remove transmission oil temperature transmitter (2).

NOTE

The operating temperature range of transmission oil temperature transmitter is +120 to +280°F.

D Disconnect wire 509D electrical connector (3).

E Unscrew and remove transmission oil high temperature switch (4).

NOTE

The operating temperature range of transmission oil high temperature switch is +298 to +312°F.

INSTALLATION

A Install transmission oil high temperature switch (4).

B Connect wire 509D electrical connector (3).

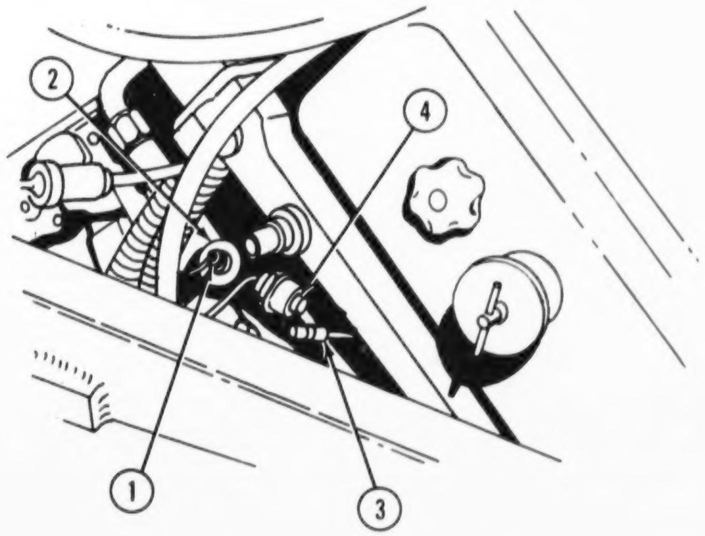
C Install transmission oil temperature transmitter (2).

D Connect wire 324 electrical connector (1).

E Close and secure right transmission door.

TA312791

TRANSMISSION OIL PRESSURE TRANSMITTER AND OIL LOW PRESSURE SWITCH: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Make sure engine has cooled before removing switches.

A Open right transmission access door.

B Disconnect wire 321 electrical connector (1).

C Unscrew and remove transmission oil pressure transmitter (2).

NOTE

The operating pressure range of transmission oil pressure transmitter is 0 to 60 psi.

D Disconnect wire 509C electrical connector (3).

E Unscrew and remove transmission low oil pressure switch (4).

NOTE

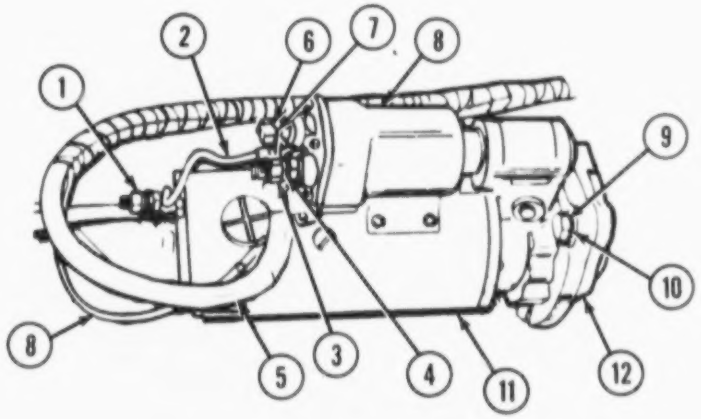
The operating pressure range of transmission low oil pressure switch is 9 to 13 psi.

INSTALLATION

Reverse removal procedures.

TA311043

STARTER MOTOR: REMOVAL AND INSTALLATION



WARNING

Starter weighs 80 lb. Use care during removal and installation.

REMOVAL

A Remove powerpack from vehicle (p 3-1).

B Remove nut (1) and disconnect ground lead (2).

C Remove nut (3), flat washer (4) and disconnect starter cable lead 82 (5).

D Remove nut (6), flat washer (7) and disconnect solenoid lead 14B (8).

E Remove three screws (9) and three lockwashers (10).

F Remove starter motor assembly (11) and mounting gasket (12). Discard gasket (12).

INSTALLATION

A Install new mounting gasket (12).

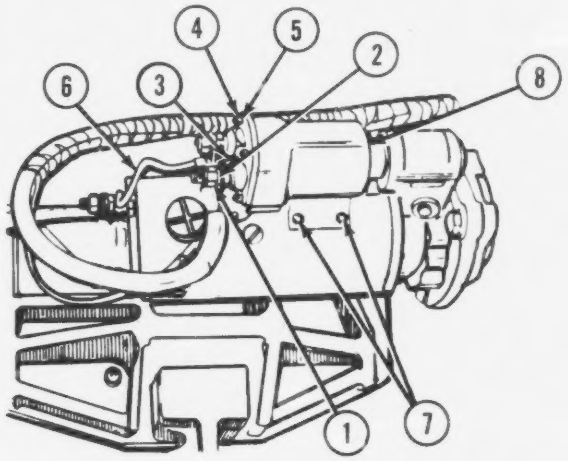
B Operate powerpack before installing in vehicle (p 3-25 thru 3-28).

C Install powerpack (p 3-26).

D Reverse removal procedures.

TA311044

STARTER SOLENOID: REMOVAL AND INSTALLATION



REMOVAL

A Remove powerpack from vehicle (p 3-1).

B Remove starter motor assembly (p 6-13).

C Remove nut (1) and flat washer (2) and disconnect bus strap (3).

D Remove screw (4) and clip (5) and disconnect solenoid ground lead (6).

E Remove four screws (7).

F Remove solenoid (8).

INSTALLATION

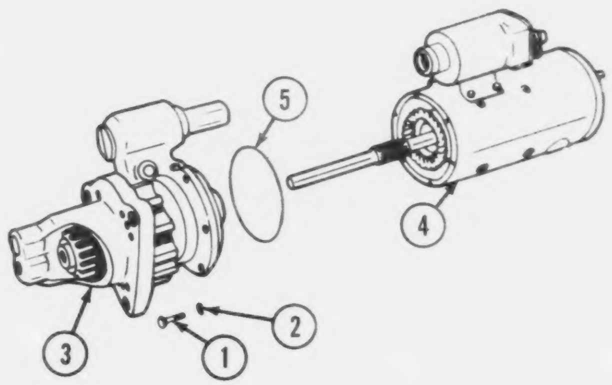
NOTE

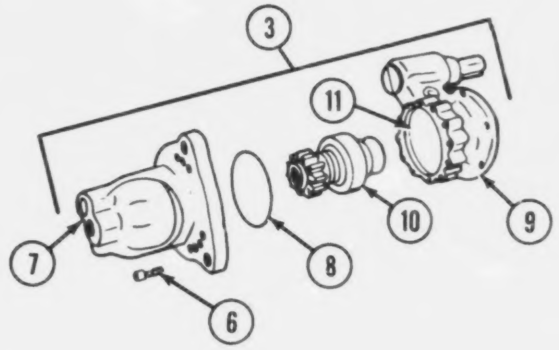
Bench test starter before installing on powerpack. Notify Support Maintenance.

Reverse removal procedures.

TA311045

STARTER CLUTCH DRIVE: REMOVAL AND INSTALLATION





REMOVAL

A Remove powerpack from vehicle (p 3-1).

B Remove starter motor (p 6-13).

C Remove five screws (1) and five lockwashers (2).

NOTE

When removing drive group (3) from motor (4), keep pressure against armature shaft to prevent armature from pulling out of brushes.

D Separate drive group (3) from motor (4). Discard gasket (5).

E Remove six screws (6).

F Separate drive housing (7), gasket (8) and shift lever housing (9). Discard gasket (8).

G Remove drive clutch (10) from shift lever yoke (11).

INSTALLATION

NOTE

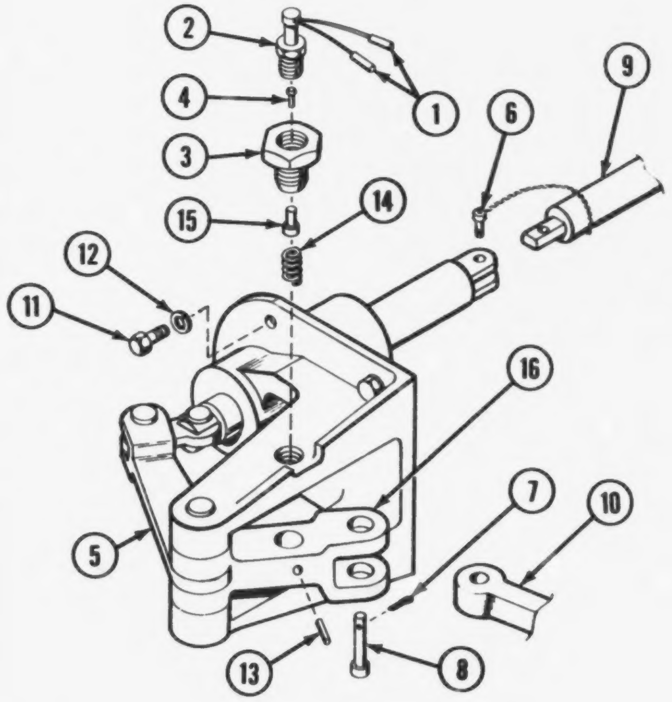
Bench test starter before installing. Notify Support Maintenance.

A Replace two gaskets (5 and 8).

B Reverse removal procedures.

TA311046

NEUTRAL SAFETY SWITCH: REMOVAL, INSTALLATION AND ADJUSTMENT



REMOVAL

A Disconnect two electrical connectors (1).

B Unscrew safety switch (2) from adapter (3) by turning counterclockwise.

C Remove pin (4).

D Unscrew adapter (3) from shift control linkage base assembly (5).

E Remove quick-release pin (6), cotter pin (7) and straight pin (8). Disconnect rods (9 and 10).

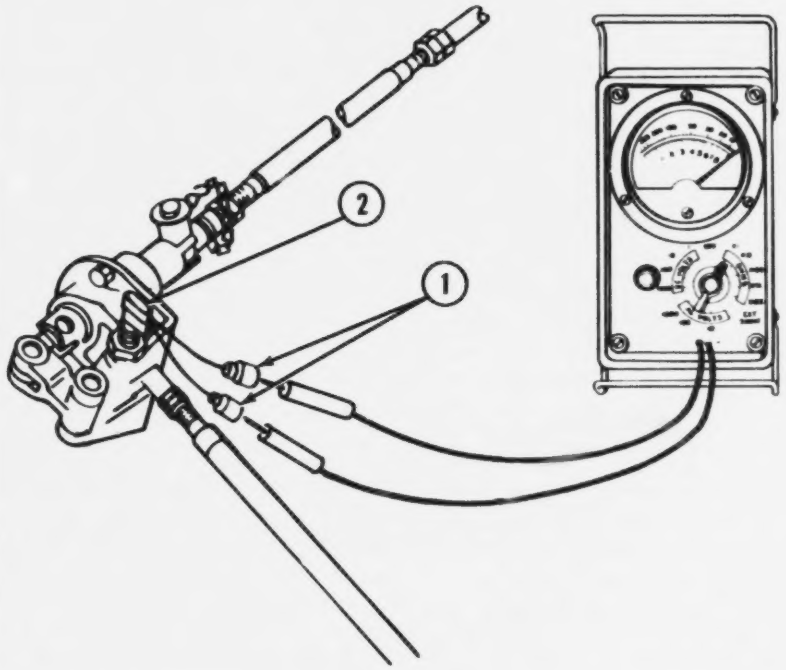
NOTE

Location of quick-release pin (6) is in powerpack compartment.

F Remove four screws (11), four lockwashers (12) and remove shift control linkage base assembly (5) from driver's compartment bulkhead.

G Remove pin (13), spring (14) and contact pin (15) from bell crank (16).

TA311047



ADJUSTMENT

A Disconnect two electrical connectors (1).

B Set transmission shift control lever in neutral (N) position.

C Using a multimeter to check continuity, turn neutral safety switch (2) until multimeter indicates 0 ohms - switch closed.

D Set transmission shift control lever to first gear. Multimeter must indicate ∞ - switch open.

E Set transmission shift control lever to neutral (N) position. Multimeter must indicate 0 - switch open. If not, repeat steps C and D.

F Set transmission shift control lever to every shift position. Check multimeter indication at each position. Multimeter must indicate ∞ at positions 1, 2, 3, 4, R1 and R2, and must indicate 0 ohms at N (neutral). If not, readjust.

INSTALLATION

Reverse removal procedures.

TA311048

AERATION DETECTOR: REMOVAL AND INSTALLATION

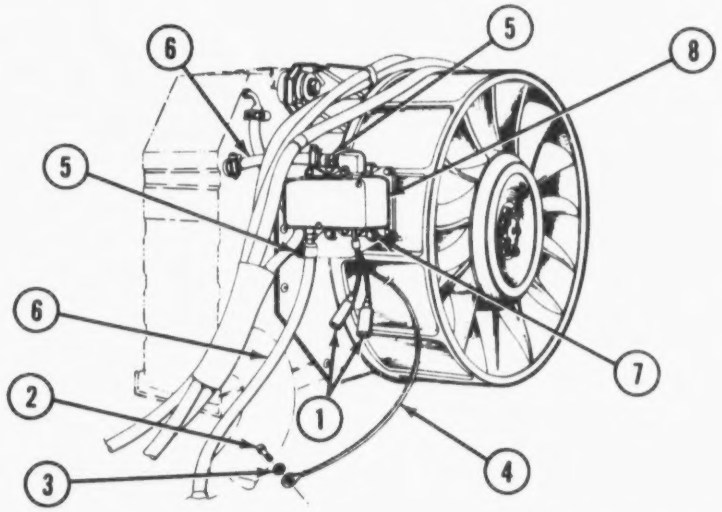
INITIAL SETUP

Equipment Condition:

Radiator fan protectors installed (p 2-5).
Coolant drained (TM 9-2350-267-10).

General Safety Instructions:

A protective fan screen must be installed prior to doing maintenance in the engine compartment when engine is running or when running engine in ground hop mode. Contact with rotating fan can cause injury.



REMOVAL

WARNING

Make sure engine and coolant are sufficiently cooled before disconnecting hoses. Removal of hoses while engine and coolant are hot will cause coolant to spurt from hoses under pressure and will cause severe burns.

A Disconnect two electrical connectors, wires 352A and 352B (1).

B Remove screw (2), flat washer (3) and ground wire (4).

C Unscrew and loosen hose clamps (5).

D Remove two hoses (6).

NOTE

Plug hoses from radiator and main tube.

E Remove four screws and four lockwashers (7).

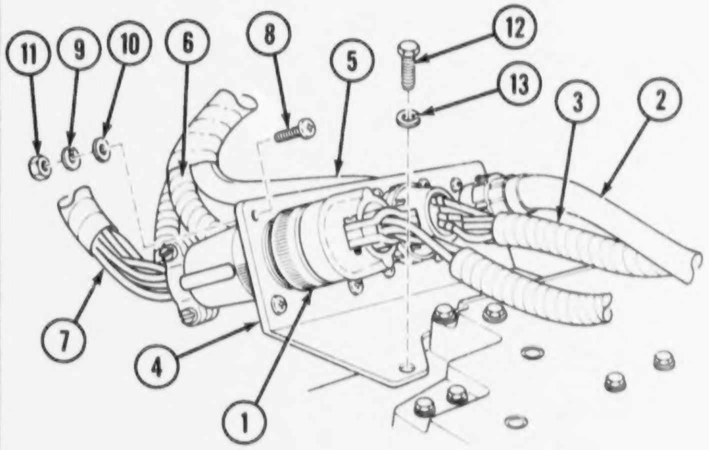
F Remove aeration detector (8).

INSTALLATION

Reverse removal procedures.

TA57153

POWERPACK WIRING HARNESS MOUNTING BRACKET: REMOVAL AND INSTALLATION



REMOVAL

WARNING

When working on vehicle's electrical system, turn MASTER switch to OFF position. Remove rings, dog tags, and other jewelry. Disconnect batteries by removing ground cables first. Connect ground cables last when connecting batteries.

A Open battery compartment access door and disconnect battery ground cable from negative battery post.

B Open and secure both transmission access doors.

C Disconnect STE/ICE wiring harness (1), starter cable connector (2) and master circuit wiring harness (3) at mounting bracket (4).

D Remove starter cable receptacle (5), master circuit harness receptacle (6) and STE/ICE harness receptacle (7) by removing four screws (8), four lockwashers (9), four flat washers (10) and four nuts (11) from each. Discard lockwashers.

E Remove two screws (12) and two lockwashers (13) and remove mounting bracket (4) from transmission. Discard lockwashers.

INSTALLATION

A Install mounting bracket (4) on transmission with two screws (12) and two new lockwashers (13).

B Install STE/ICE harness receptacle (7), master circuit harness receptacle (6) and starter cable receptacle (5) with four screws (8), four new lockwashers (9), four flat washers (10) and four nuts (11) for each receptacle.

C Connect STE/ICE wiring harness (1), starter cable connector (2) and master circuit wiring harness (3) at mounting bracket (4).

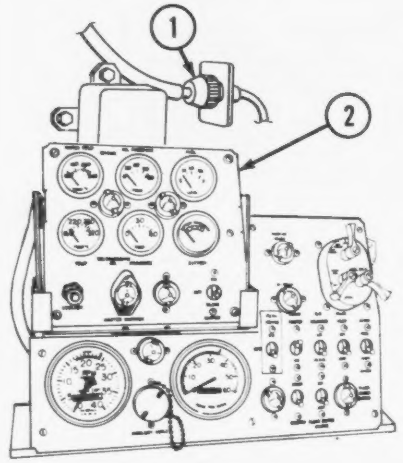
D Close and secure both transmission access doors.

E Connect battery ground cable at negative battery post and close battery compartment access door.

TA312792

Section II HULL ELECTRICAL SYSTEMS

PORTABLE AND DRIVER'S INSTRUMENT PANELS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

WARNING

Set MASTER switch OFF. Disconnect battery ground cables.

NOTE

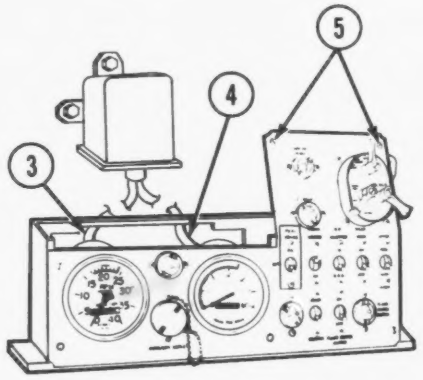
Remove portable instrument panel before driver's panel.

A Disconnect electrical harness (1) at hull-mounted bracket.

B Lift off portable instrument panel (2) from driver's instrument panel bracket.

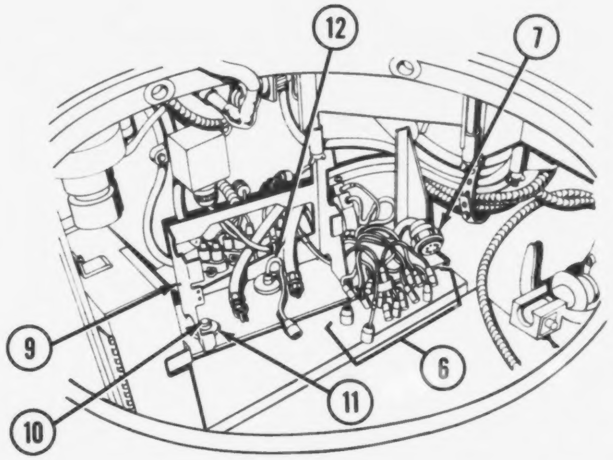
C Disconnect flexible tachometer cable (3) and speedometer cable (4) from instrument panel.

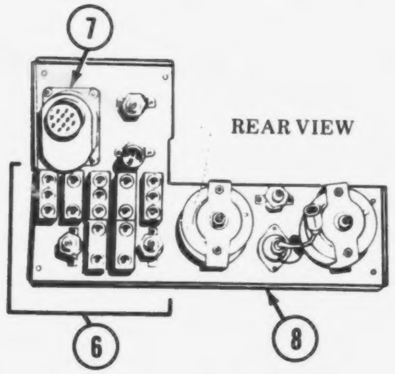
D Use screwdriver to unfasten six stud fasteners (5) by pushing in and turning counterclockwise.



TA311050

PORTABLE AND DRIVER'S INSTRUMENT PANELS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)





E Disconnect 23 instrument panel connectors (6) and light switch connector (7).

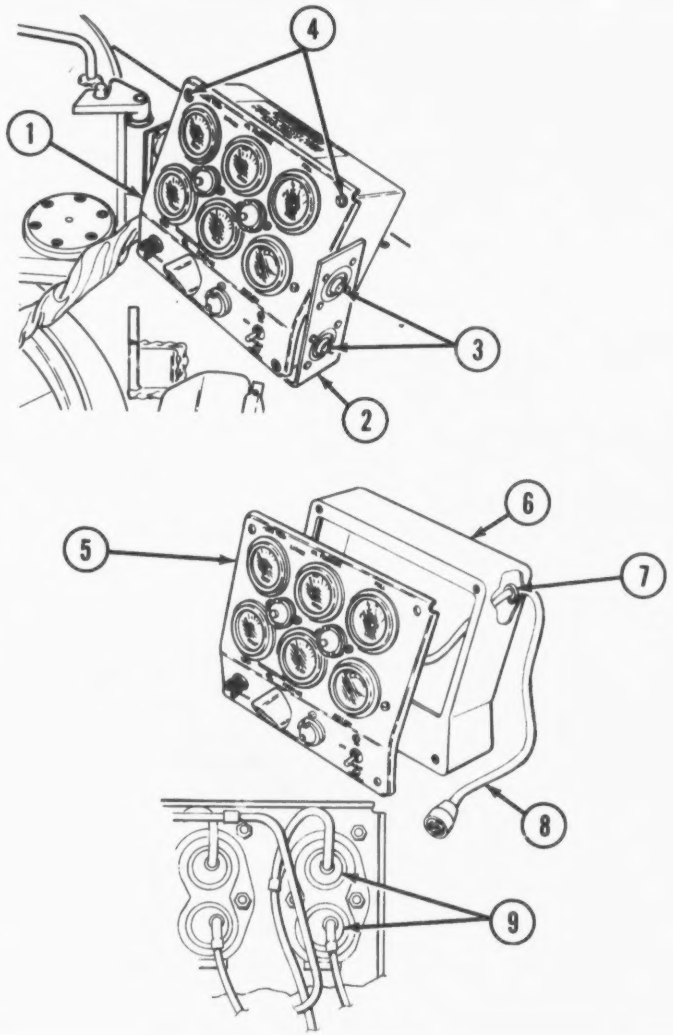
F Remove driver's instrument panel (8) from mounting support (9).

G Remove four screws (10) and four lockwashers (11) and ground strap (12).

H Remove mounting support (9).

TA311051

PORTABLE AND DRIVER'S INSTRUMENT PANELS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Separate portable instrument panel (1) from bracket assembly (2) by removing four crosspoint screws (3).

B Using screwdriver, unfasten four stud fasteners (4) by pushing in and turning counterclockwise.

C Pull panel (5) away from instrument panel cover (6).

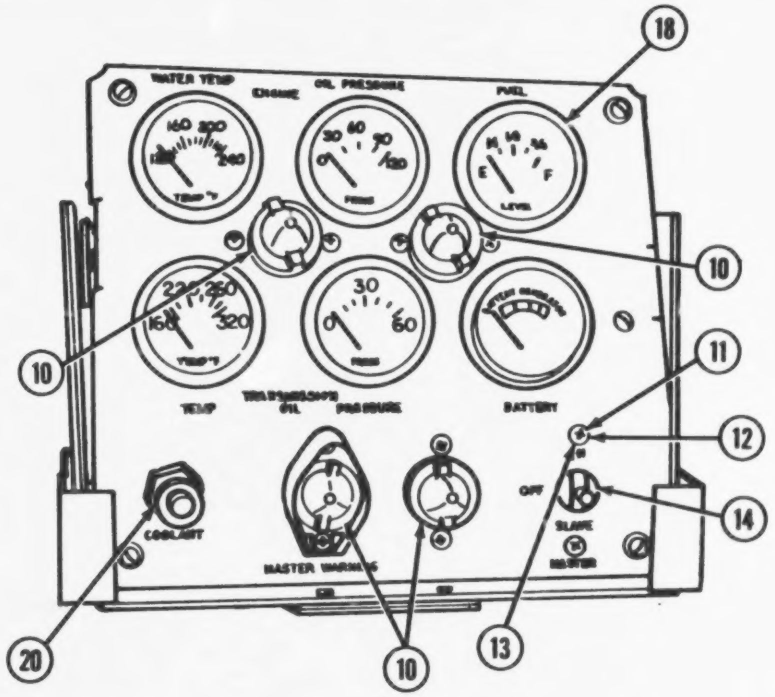
D Slide grommet (7) back over harness assembly (8) and remove.

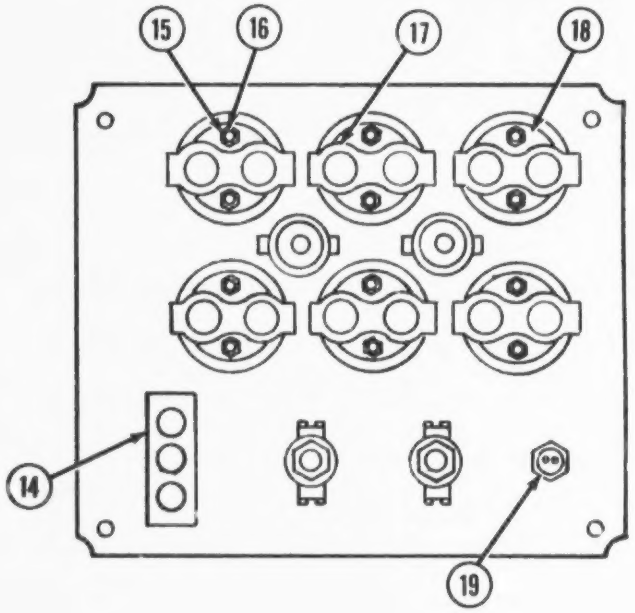
E Disconnect 19 electrical connectors (9) at back of panel (p

F Remove harness assembly (8) from instrument panel cover (6).

TA311052

PORTABLE AND DRIVER'S INSTRUMENT PANELS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


18
WATER TEMP
ENGINE
OIL PRESSURE
FUEL
10
11
10
TEMP
TRANSMISSION OIL PRESSURE
BATTERY
12
OFF
14
SLAVE
MASTER
COOLANT
MASTER WARNING
20
10
13


15
16
17
18
14
19

G Unscrew and remove four lamp assemblies (10) from front of panel.

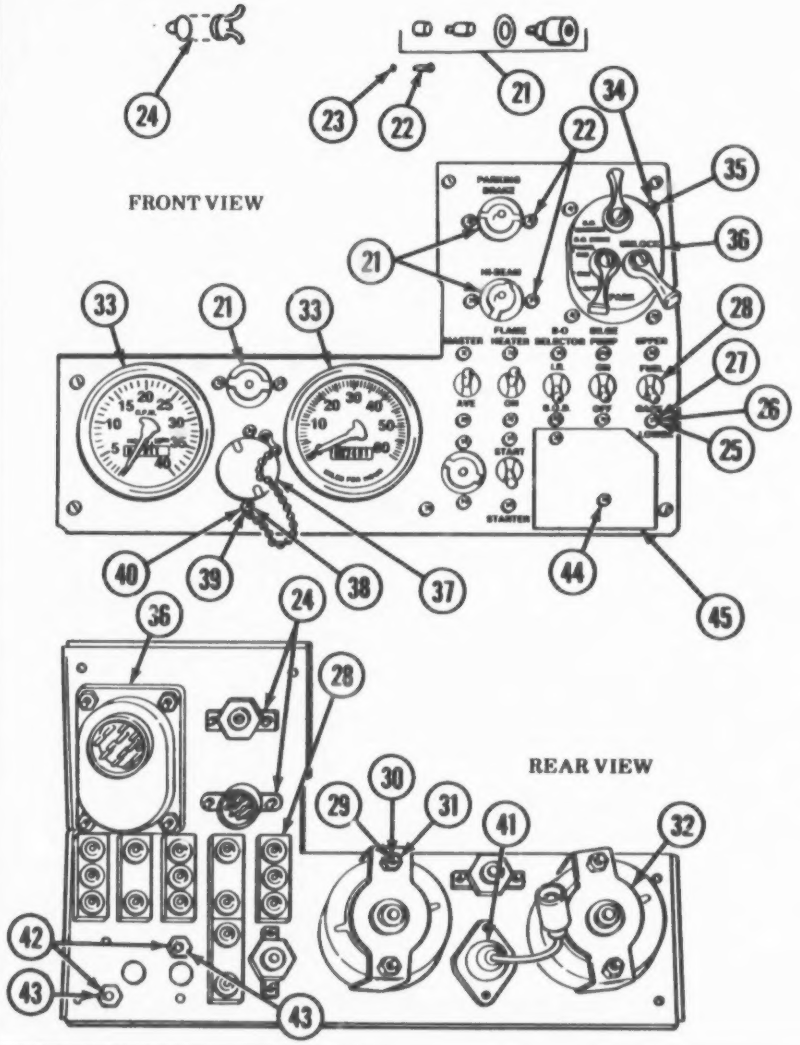
H Remove two screws (11), two flat washers (12), two lockwashers (13) and master switch (14).

I Remove 12 nuts (15), 12 lockwashers (16), six brackets (17) and six indicators (18).

J Remove hex nut (19) and coolant light (20).

TA311053

PORTABLE AND DRIVER'S INSTRUMENT PANELS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)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35
FRONT VIEW
36
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33
21
33
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26
25
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39
38
37
44
45
36
24
28
REAR VIEW
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29
31
41
32
42
43
43

K Unscrew and remove five lamp assemblies (21) from front of panel.

L Remove eight screws (22), eight washers (23) and four light brackets (24).

M Remove 12 screws (25), 12 lockwashers (26), 12 flat washers (27) and six switch assemblies (28).

N Remove four screws (29), four lockwashers (30), four nuts (31), two brackets (32) and two indicators (33).

O Remove four screws (34), four lockwashers (35) and light switch (36).

P Remove cover (37), two screws (38), two flat washers (39), two lockwashers (40) and auxiliary outlet (41).

Q Remove two nuts (42), two flat washers (43), two screws (44) and cover plate (45).

ASSEMBLY

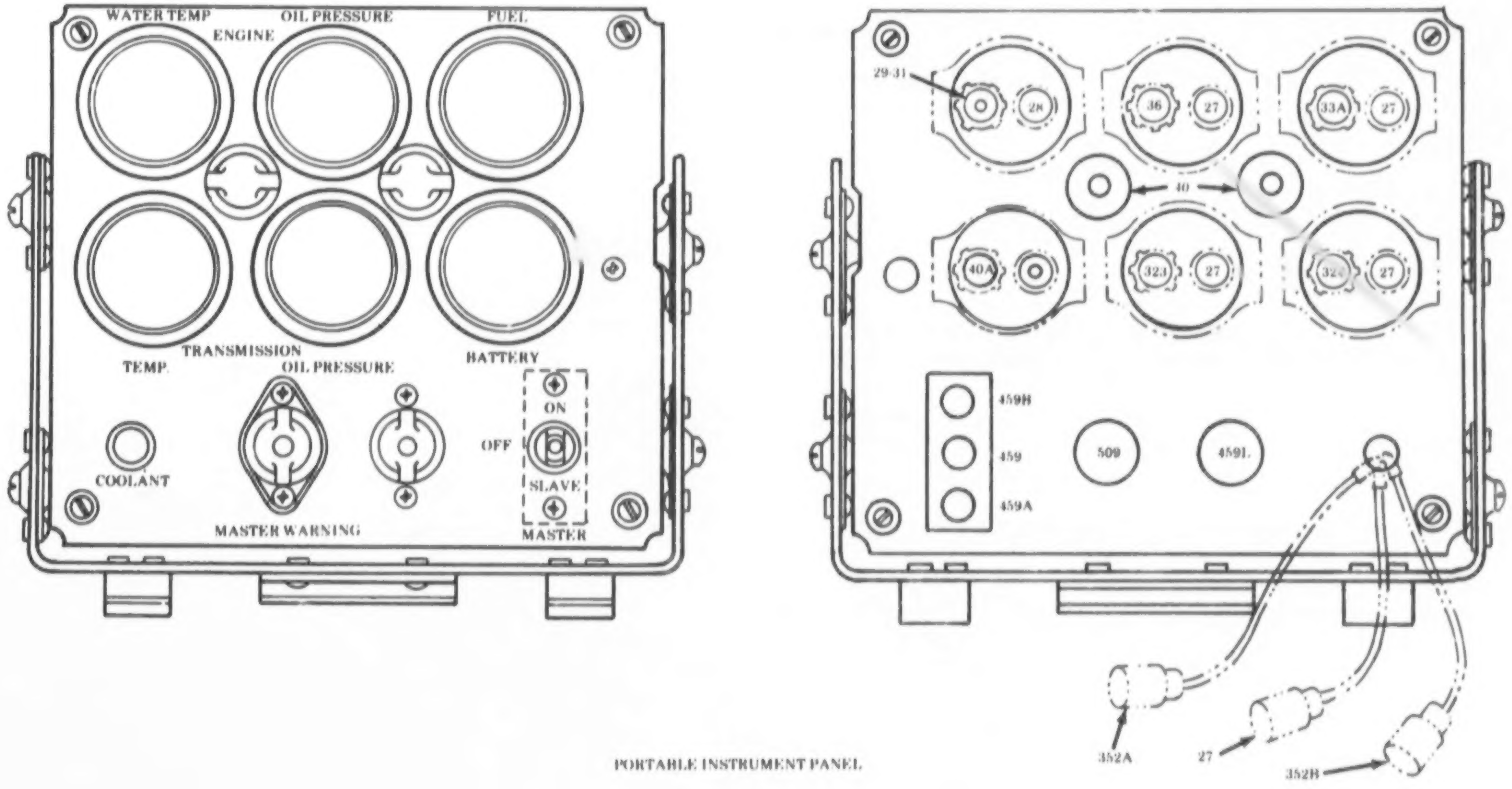
Reverse disassembly procedures.

TA57157

PORTABLE AND DRIVER'S INSTRUMENT PANELS: REMOVAL, ASSEMBLY, DISASSEMBLY AND INSTALLATION (CONTINUED)

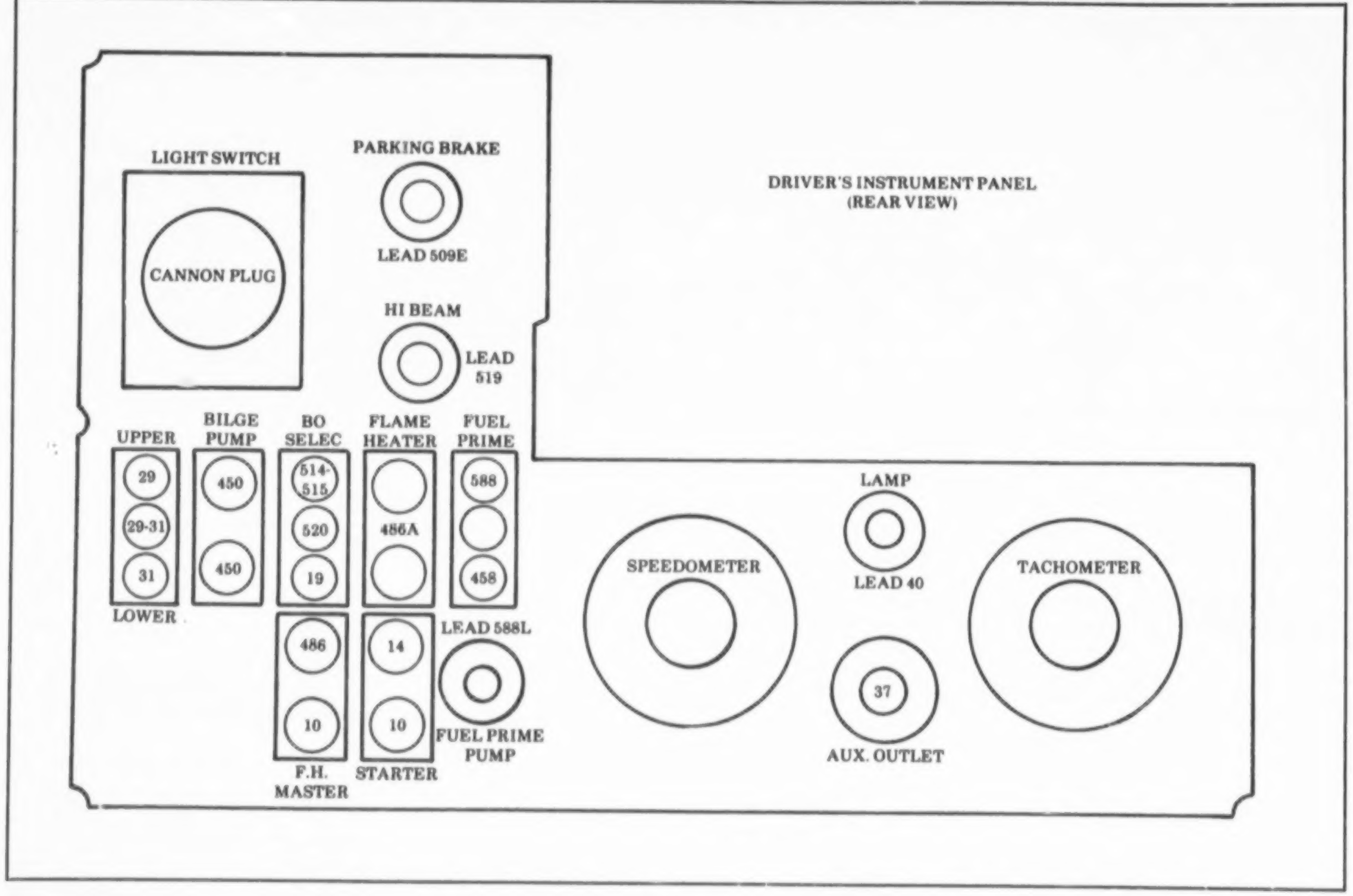
INSTALLATION (PORTABLE AND DRIVER'S PANELS)

Reverse removal procedures.


WATER TEMP
ENGINE
OIL PRESSURE
FUEL
TEMP.
TRANSMISSION
OIL PRESSURE
BATTERY
ON
OFF
SLAVE
MASTER
COOLANT
MASTER WARNING
29-31
28
36
27
33A
27
40
40A
323
27
324
27
459B
459
459A
509
459L
352A
27
352B

PORTABLE INSTRUMENT PANEL

TA311055


LIGHT SWITCH
CANNON PLUG
PARKING BRAKE
LEAD 509E
HI BEAM
LEAD 519
DRIVER'S INSTRUMENT PANEL (REAR VIEW)
UPPER
29
29-31
31
LOWER
BILGE PUMP
450
450
BO SELEC
514-515
520
19
FLAME HEATER
486A
FUEL PRIME
588
458
486
10
F.H. MASTER
14
10
STARTER
LEAD 588L
FUEL PRIME PUMP
SPEEDOMETER
LAMP
LEAD 40
37
AUX. OUTLET
TACHOMETER

TA57154

ACCESSORY CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.

REMOVAL

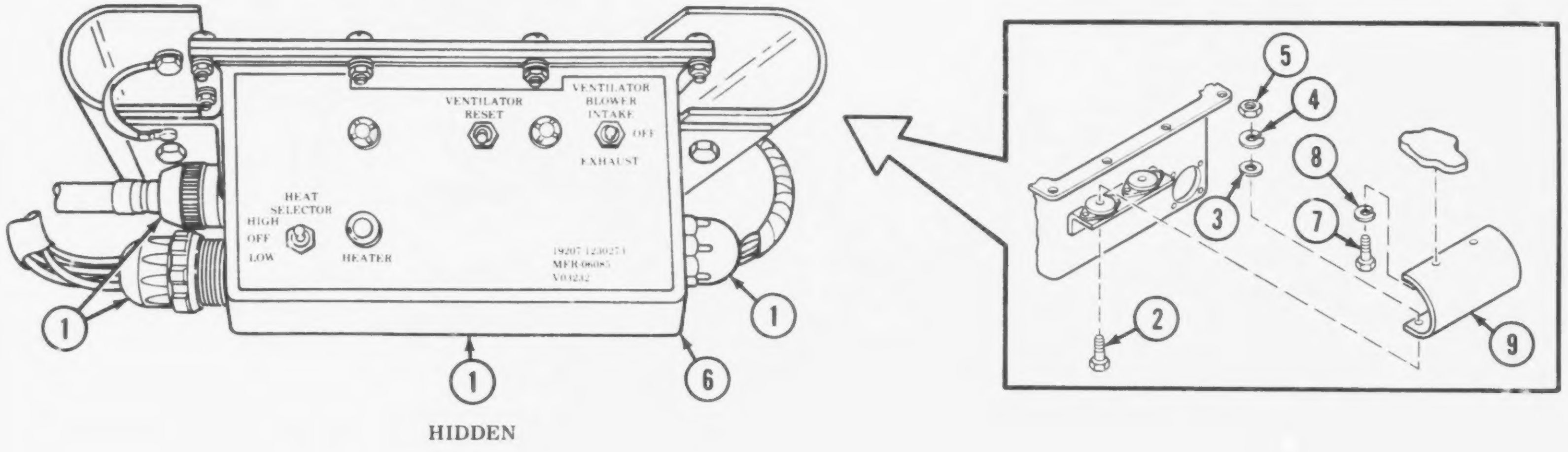
A Disconnect four electrical connectors (1).

NOTE

Support accessory control box while removing screws.

B Remove four screws (2), three flat washers (3), four lockwashers (4), four nuts (5) and control box (6). Discard lockwashers.

C Remove four screws (7), four lockwashers (8) and two mounting brackets (9). Discard lockwashers.


VENTILATOR RESET
VENTILATOR BLOWER INTAKE
OFF
EXHAUST
HEAT SELECTOR
HIGH
OFF
LOW
HEATER
19207 12302?1
MFR 06085
V03232
①
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HIDDEN
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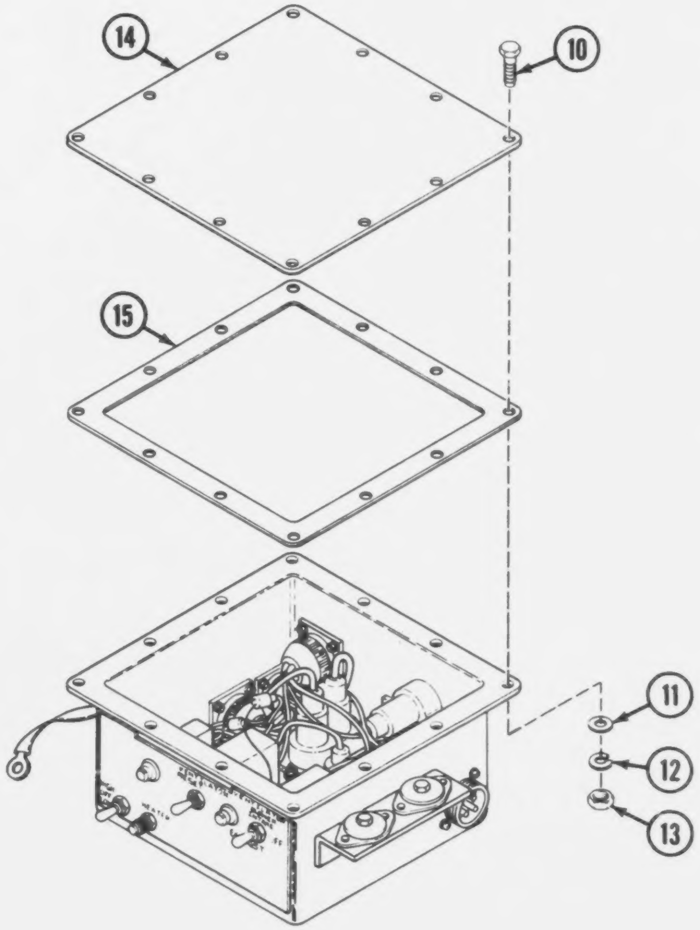
TA57350

ACCESSORY CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



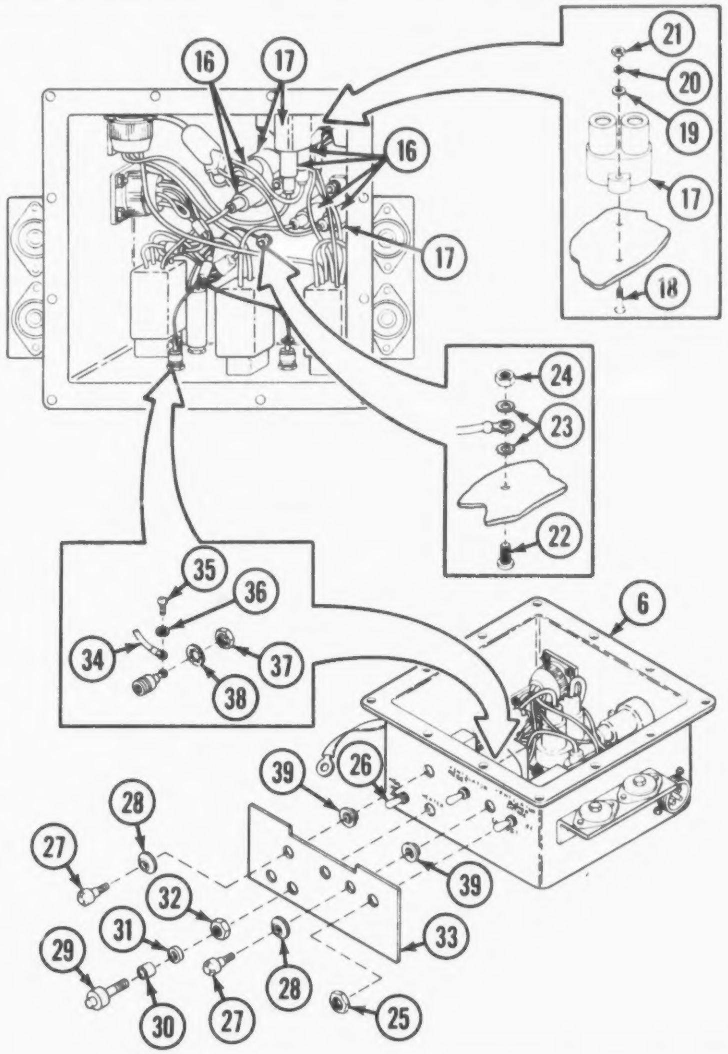
DISASSEMBLY

A Remove 12 screws (10), 12 flat washers (11), 12 lockwashers (12) and 12 nuts (13). Discard lockwashers.

B Remove cover (14) and gasket (15). Discard gasket.

TA57345

ACCESSORY CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



NOTE

Refer to Accessory Control Box Wiring Schematic, Appx F to ensure proper installation.

C Disconnect six electrical connectors (16) from circuit breakers (17).

D Remove six screws (18), six flat washers (19), six lockwashers (20), six nuts (21) and three circuit breakers (17). Discard lockwashers.

E Remove screw (22), two lockwashers (23) and nut (24). Discard lockwashers.

F Unscrew three hexnuts (25) and pull three switches (26) into accessory control box (6).

G Remove two leads on ventilator/blower switch (26) between terminals 4 and 3, and 6 and 1.

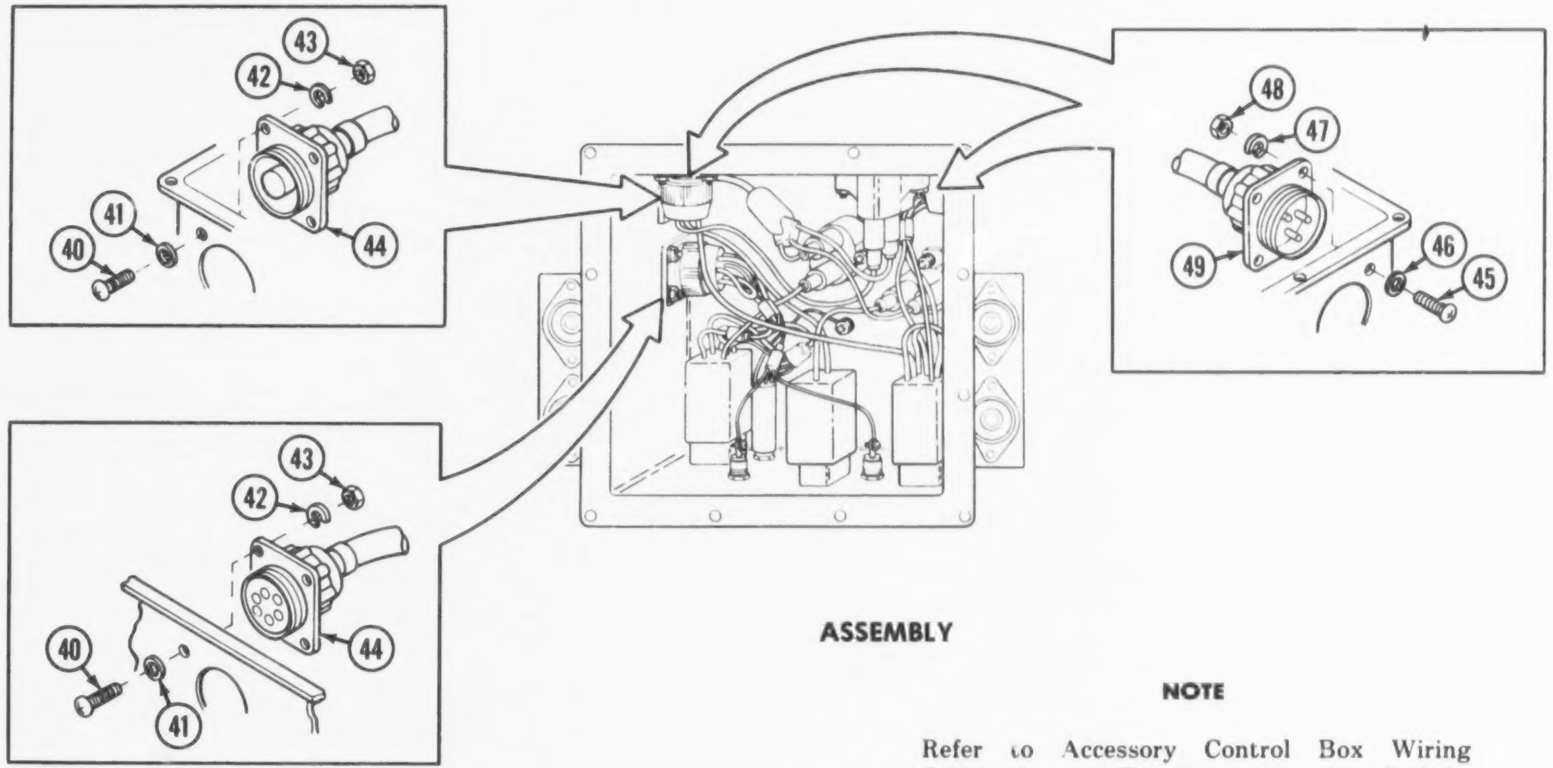
H Remove two panel light lamps (27) and two gaskets (28).

I Remove indicator light cap (29), lamp (30), gasket (31), hexnut (32), and indicator panel (33) from accessory control box (6).

J Disconnect wire (34) by removing screw (35) and washer (36). Remove nut (37) and washer (38) and pull light bracket (39) out of accessory control box (6).

TA57346

ACCESSORY CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



K Remove eight screws (40), eight flat washers (41), eight lockwashers (42), eight nuts (43) and two electrical connectors (44). Discard lockwashers.

L Remove eight screws (45), eight flat washers (46), eight lockwashers (47), eight nuts (48) and two electrical connectors (49). Discard lockwashers.

ASSEMBLY

NOTE

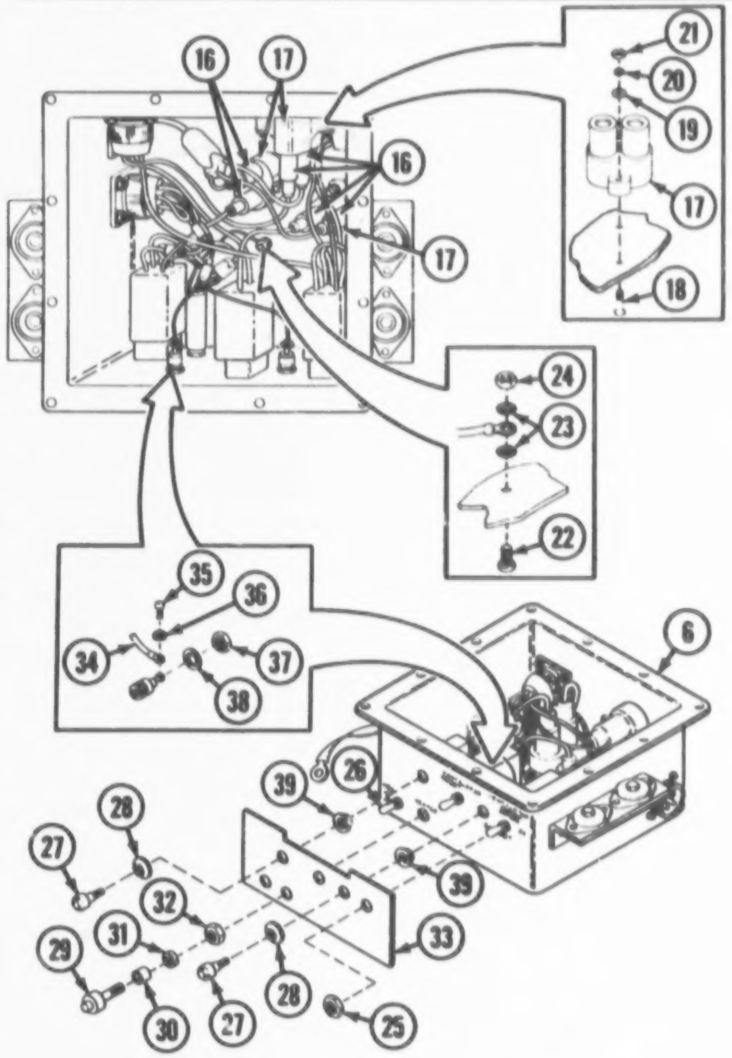
Refer to Accessory Control Box Wiring Schematic, Appx F to ensure proper installation.

A Install eight screws (45), eight flat washers (46), eight new lockwashers (47), eight nuts (48) and two electrical connectors (49).

B Install eight screws (40), eight flat washers (41), eight new lockwashers (42), eight nuts (43) and two electrical connectors (44).

TA57347

ACCESSORY CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



C Install light bracket (39) in accessory control box (6) with washer (38) and nut (37). Connect wire (34) with washer (36) and screw (35).

D Install indicator panel (33), indicator light cap (29), lamp (30), gasket (31) and hexnut (32) on light bracket (39) in accessory control box (6).

E Install two panel light lamps (27) and two gaskets (28).

F Connect two leads on ventilator/blower switch (26) between terminals 4 and 3, and 6 and 1.

G Install three switches (26) and three hexnuts (25) to accessory control box (6).

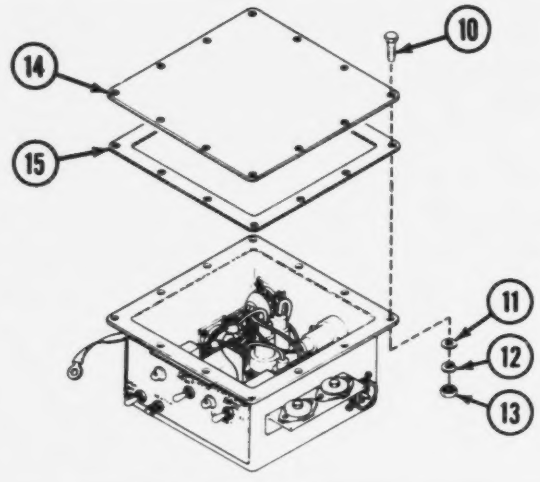
H Install screw (22), two new lockwashers (23) and nut (24).

I Install six screws (18), six flat washers (19), six new lockwashers (20), six nuts (21) and three circuit breakers (17).

J Connect six electrical connectors (16) to circuit breakers (17).

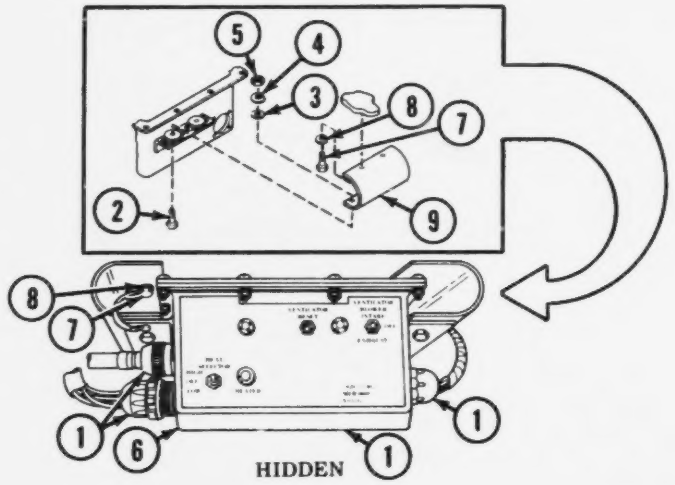
TA57353

ACCESSORY CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



K Install cover (14) and new gasket (15).

L Install 12 screws (10), 12 flat washers (11), 12 new lockwashers (12) and 12 nuts (13).



INSTALLATION

A Install four screws (7), four new lockwashers (8), and two mounting brackets (9).

NOTE

Support accessory control box while installing screws.

B Install control box (6) with four screws (2), five flat washers (3), four new lockwashers (4) and four nuts (5).

C Connect four electrical connectors (1).

TA57349

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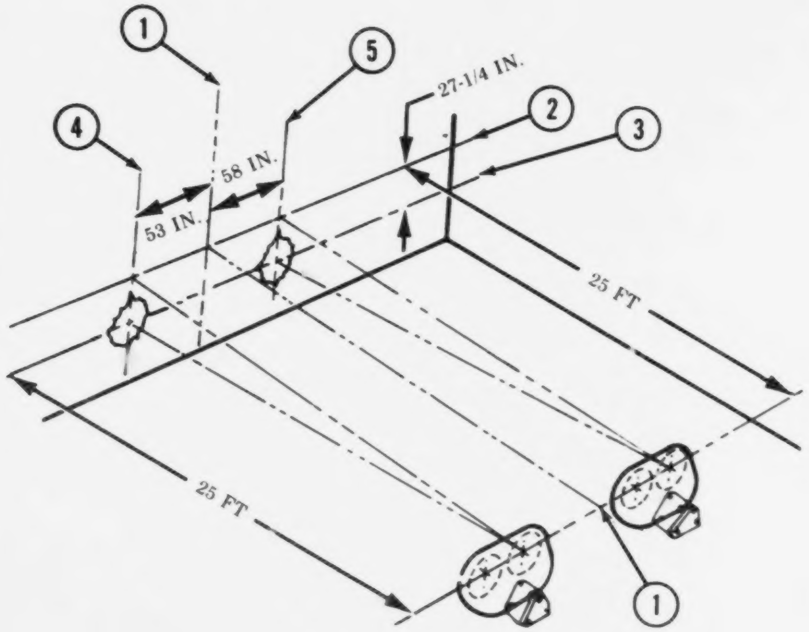
HEADLIGHTS: ALINEMENT, REMOVAL, INSTALLATION AND ADJUSTMENT



ALINEMENT

A Park vehicle on level ground or pavement 25 feet from wall or screen.

B Draw line (1) perpendicular to wall or screen, passing through center of vehicle.

C Measure distance from center of sealed lamp unit (service side, clear) to ground. Duplicate this measurement on wall or screen, drawing horizontal centerline (2) of lamp unit.

D Draw line (3) parallel to and 27-1/4 inches below line (2).

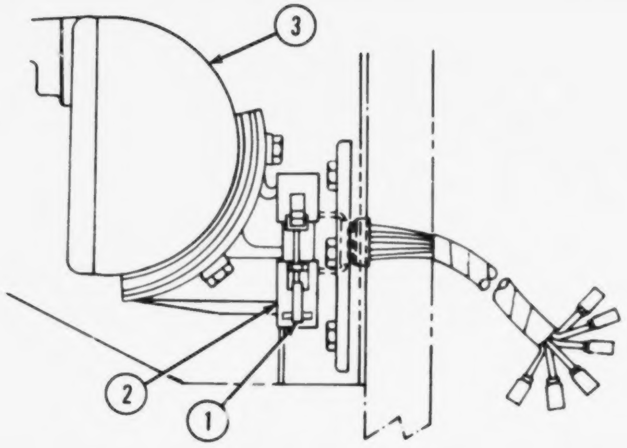
E Draw line (4) parallel to and 53 inches left of centerline of vehicle.

F Draw line (5) parallel to and 58 inches right of centerline of vehicle.

G Turn on lights to low beam. Center of left beam's highest light intensity should be where lines (3 and 4) cross. Center of right beam's highest light intensity should be where lines (3 and 5) cross. Adjust if necessary (p 6-30).

TA311060

HEADLIGHTS: ALINEMENT, REMOVAL, INSTALLATION AND ADJUSTMENT (CONTINUED)



REMOVAL

A Pull upward on T-handle locking device (1).

B Remove retaining clamp (2).

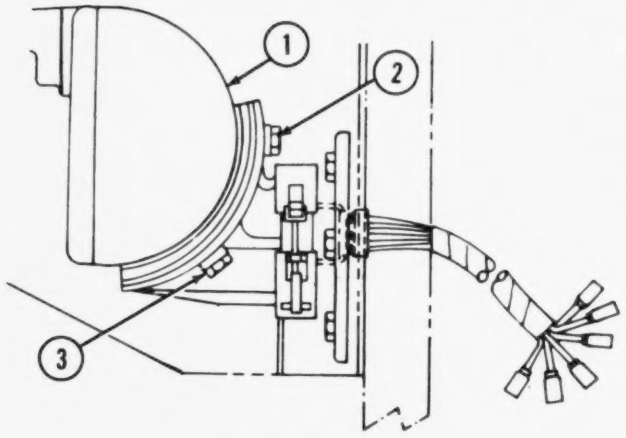
CAUTION

Do not twist headlight assembly during removal or installation. Damage to connectors may result.

C Pull headlight assembly (3) straight out.

INSTALLATION

Reverse removal procedures.



ADJUSTMENT

A Remove headlight assembly (1).

B Loosen two nuts (2) and two nuts (3).

C Install headlight assembly (1).

D Manually adjust headlight (1) to alinement marks (p

E Tighten two lower nuts (3).

F Remove headlight assembly (1).

G Tighten two upper nuts (2).

H Install headlight assembly (1).

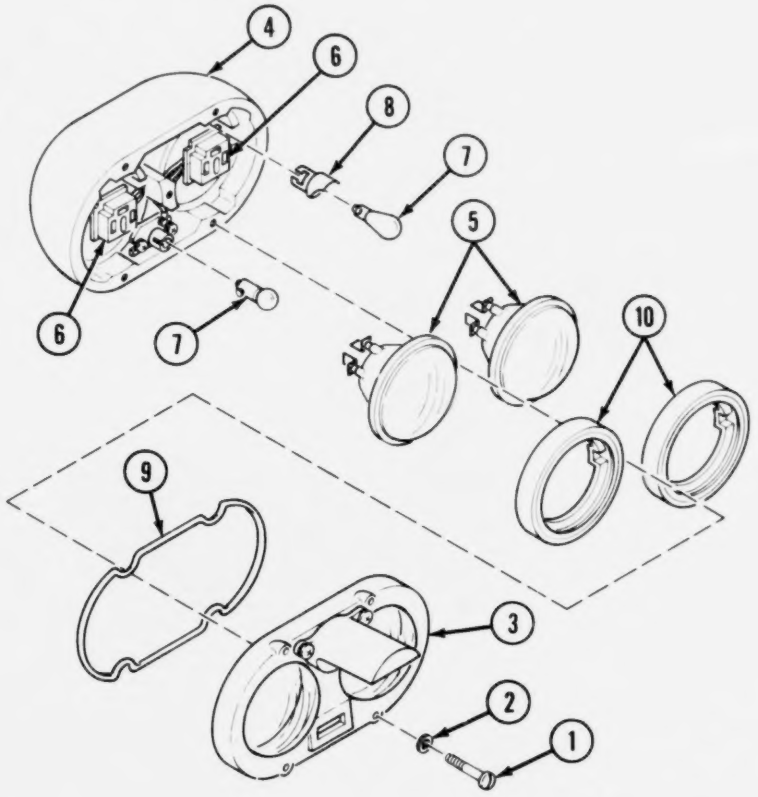
TA311061

HEADLIGHT SEALED-BEAM AND INCANDESCENT LAMPS: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Adhesive (item 2, Appx D)



REMOVAL

WARNING

Set MASTER switch OFF. Disconnect battery ground cables.

A Remove four screws (1) and four lockwashers (2), and cover (3) from headlight body (4). Discard lockwashers.

B Pull two sealed-beam lamps (5) out of body (4).

C Disconnect two electrical connectors (6) from sealed-beam lamps (5).

D Push in blackout lamps (7), turn counterclockwise and remove.

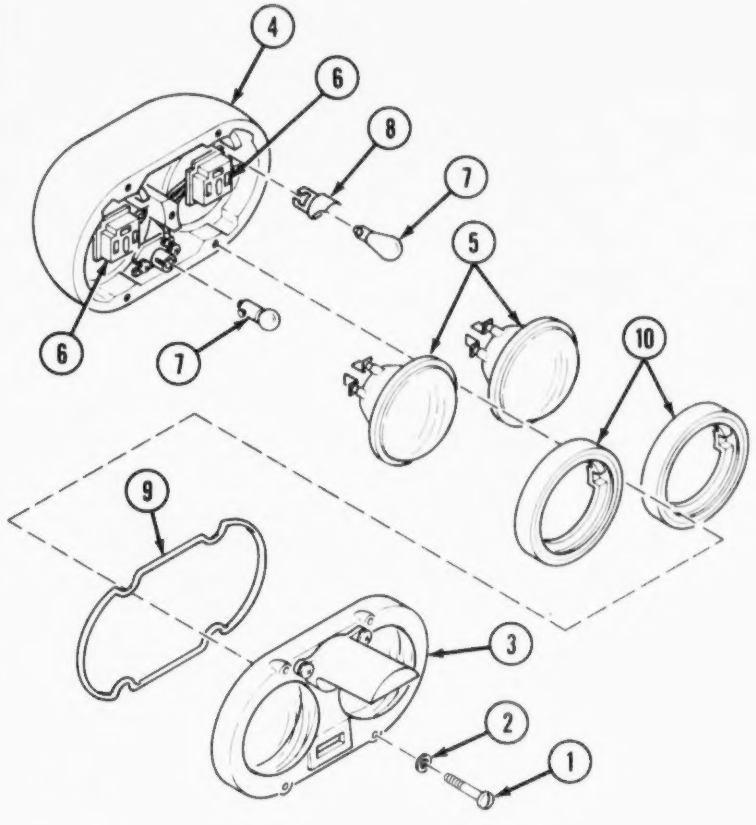
E Pull out and remove blackout drive reflector (8).

F Remove and discard seal (9) from cover (3).

G Remove two gaskets (10) from two sealed-beam lamps (5). Discard gaskets if damaged.

TA312793

HEADLIGHT SEALED-BEAM AND INCANDESCENT LAMPS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install two gaskets (10) on two sealed-beam lamps (5)

B Coat new seal (9) with adhesive (item 2, Appx D) and install in cover (3).

C Install blackout drive reflector (8).

D Install blackout lamps (7) by pushing in and turning clockwise.

E Connect two electrical connectors (6) to sealed-beam lamps (5).

F Push two sealed-beam lamps (5) into body (4).

G Install cover (3) on headlight body (4) with four screws (1) and four new lockwashers (2).

TA312794

HEADLIGHT ASSEMBLY: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Materials/Parts:

Dry film lubricant (item 33, Appx D)
Adhesive (item 2, Appx D)
Sealing compound (item 55, Appx D)

DISASSEMBLY

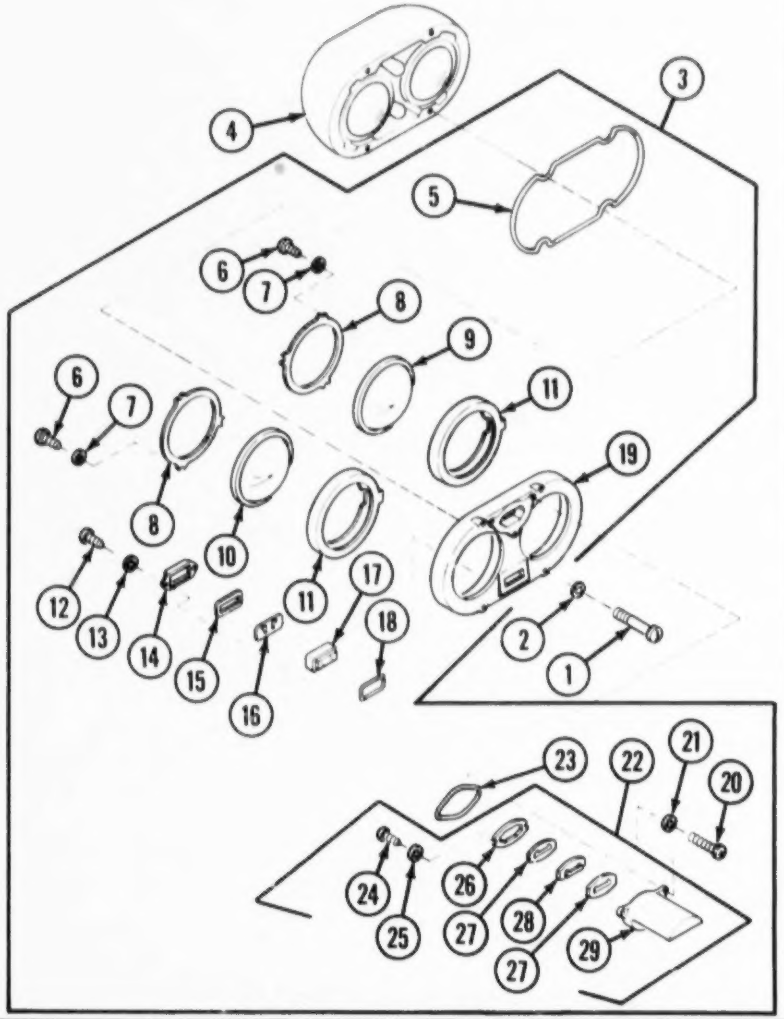
A Remove four screws (1), four lockwashers (2) and cover assembly (3) from body (4). Discard lockwashers.

B Disassemble cover assembly (3) by removing seal (5), six screws (6), six lockwashers (7), two retainers (8), infrared lens (9), service headlight lens (10), two gaskets (11), two screws (12), two lockwashers (13), retainer (14), gasket (15), filter (16), lens (17) and gasket (18) from cover (19). Discard lockwashers. Discard gaskets and seal if damaged.

C Remove three screws (20), three lockwashers (21) and light shield assembly (22). Discard lockwashers.

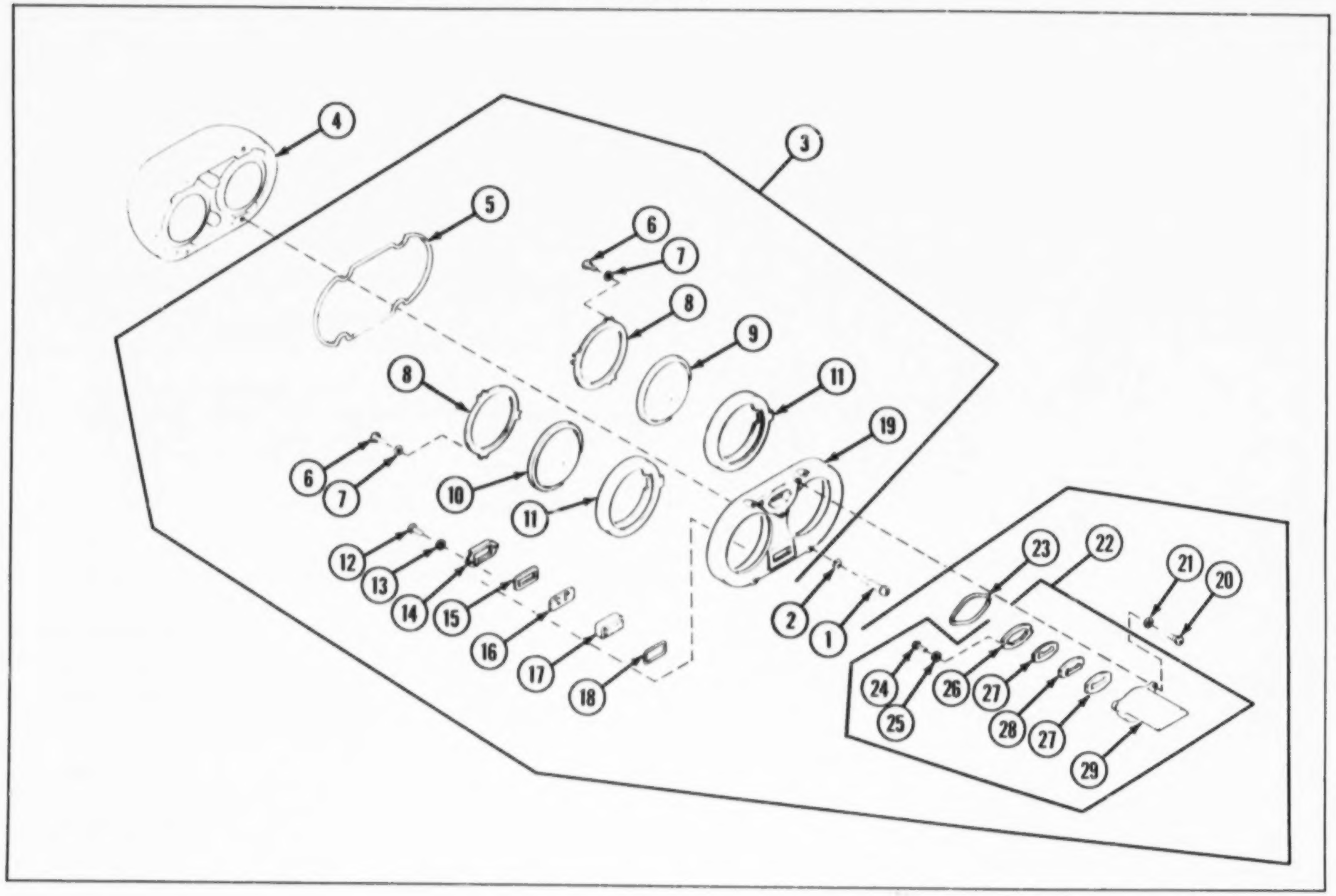
D Remove gasket (23). Discard if damaged.

E Disassemble light shield assembly (22) by removing two screws (24), two lockwashers (25), retainer (26), two gaskets (27) and lens (28) from shield (29). Discard lockwashers. Discard gaskets if damaged.



TA312795

HEADLIGHT ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)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TA312796

HEADLIGHT ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)

ASSEMBLY

A Apply dry film lubricant (item 33, Appx D) between gasket (27) and shield (29).

B Assemble light shield assembly (22) by installing lens (28), two gaskets (27), retainer (26), two new lockwashers (25) and two screws (24) in shield (29).

C Coat gasket (23) with adhesive (item 2, Appx D) and install in shield assembly (22).

D Install light shield assembly (22) with three screws (20) and three new lockwashers (21).

E Coat gasket (18) with sealing compound (item 55, Appx D) and install in cover (19).

F Install lens (17), filter (16), gasket (15) and retainer (14) on cover (19) with two new lockwashers (13) and two screws (12).

NOTE

Make sure infrared lens is installed on left side looking forward.

G Install two gaskets (11), service headlight lens (10), infrared lens (9) and two retainers (8) on cover (19) with six new lockwashers (7) and six screws (6).

H Coat seal (5) with adhesive (item 2, Appx D) and install in cover (19).

I Install cover assembly (3) on body (4) with four screws (1) and four new lockwashers (2).

TA312797

HEADLIGHT BODY: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

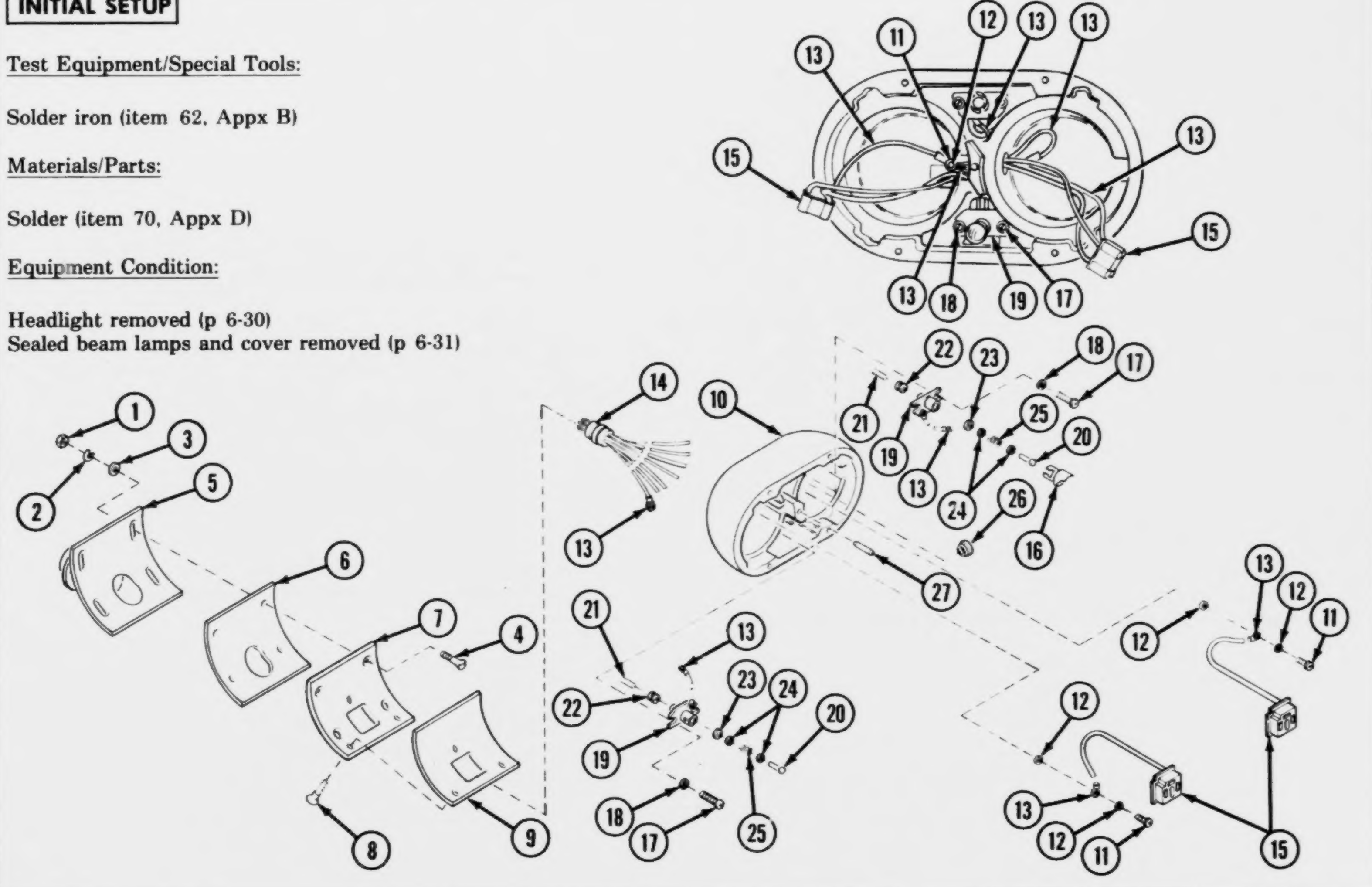
Solder iron (item 62, Appx B)

Materials/Parts:

Solder (item 70, Appx D)

Equipment Condition:

Headlight removed (p 6-30)
Sealed beam lamps and cover removed (p 6-31)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TA312798

HEADLIGHT BODY: DISASSEMBLY AND ASSEMBLY (CONTINUED)

DISASSEMBLY

NOTE

Tag all electrical leads upon removal to ensure proper installation.

A Remove four nuts (1), four lockwashers (2) and four flat washers (3) from four screws (4). Discard lockwashers.

B Remove mounting bracket (5) and gasket (6) from plate (7). Discard gasket.

C Remove three screws (8), plate (7), four screws (4) and gasket (9) from headlight body (10). Discard gasket.

D Remove two screws (11) and four lockwashers (12) to release five ground leads (13). Discard lockwashers.

E Remove four wiring harness (14) leads from two connectors (15) and remove connectors.

F Remove reflector (16).

G Remove four screws (17) and four lockwashers (18) to release two socket assemblies (19) from headlight body (10). Discard lockwashers.

H Remove two wiring harness (14) leads from two tubular rivets (20). Discard rivets.

I Remove wiring harness (14) lead, insulator (21), grommet (22), washer (23), two washers (24) and spring (25) from each of two socket assemblies (19). Discard insulator.

J Remove wiring harness (14) from headlight body (10).

K Remove grommet (26) and pin (27) from headlight body (10).

ASSEMBLY

A Install grommet (26) and pin (27) in headlight body (10).

B Install wiring harness (14) through grommet (26) in headlight body (10).

C Install new insulator (21), grommet (22), socket assembly (19), washer (23), one washer (24), spring (25) and one washer (24) on each of two wiring harness (14) leads.

D Solder two new tubular rivets (20) to two wiring harness (14) leads.

E Secure two socket assemblies (19) to headlight body (10) with four screws (17) and four new lockwashers (18).

F Install reflector (16).

G Install four wiring harness (14) leads to two connectors (15).

H Secure five ground leads (13) to headlight body (10) with two screws (11) and four new lockwashers (12).

I Install four screws (4) in plate (7).

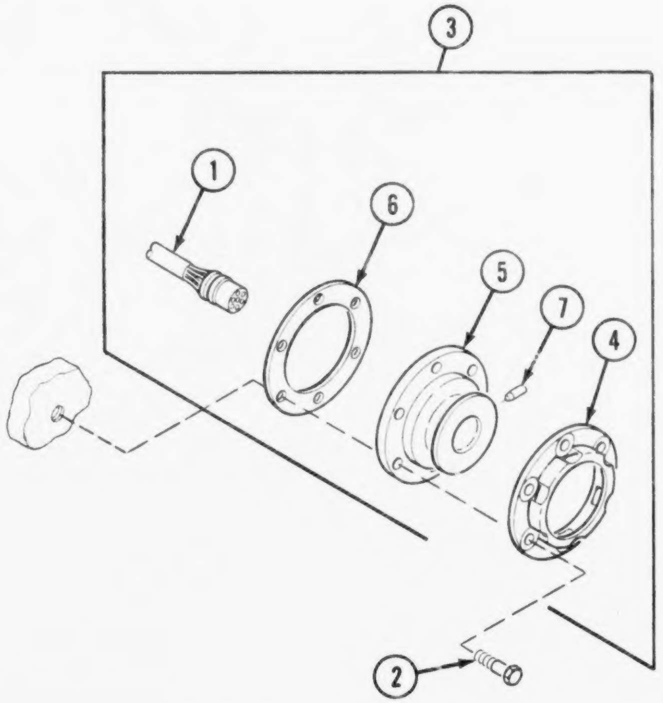
J Install plate (7) and new gasket (9) on headlight body (10) with three screws (8).

K Install new gasket (6) and mounting bracket (5) on plate (7).

L Install four flat washers (3), four new lockwashers (2) and four nuts (1) on four screws (4).

TA312799

HEADLIGHT MOUNT: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Unplug wiring harness (1).

B Remove six screws (2).

C Remove hull mount assembly (3).

D Separate retainer (4), mount (5) and gasket (6). Discard gasket.

E Remove pin (7).

F Remove wiring harness (1) from headlight body wiring harness socket.

ASSEMBLY

A Install wiring harness (1) in headlight body wiring harness socket.

B Install pin (7) in mount (5).

C Install retainer (4), mount (5) and new gasket (6) on hull with six screws (2).

D Plug in wiring harness (1).

TA312800

RIGHT TAILLAMP ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

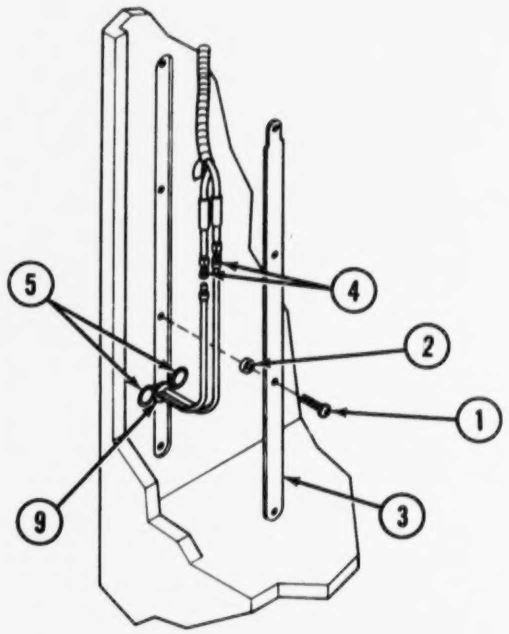
INITIAL SETUP

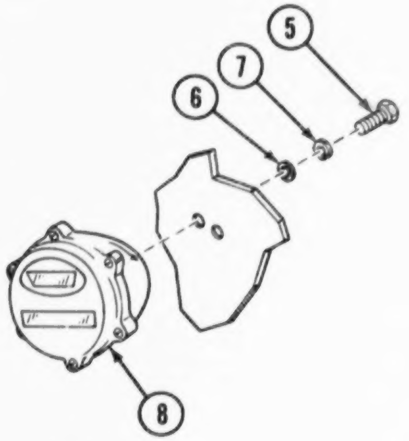
Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER Switch OFF.

Personnel Required:

Two





REMOVAL

NOTE

Be careful that spacers do not fall during removal.

A Remove four screws (1), four spacers (2) and cover plate (3) from vehicle crew compartment.

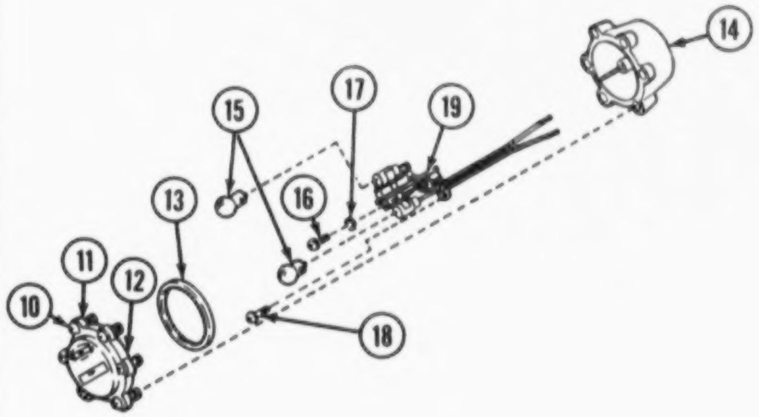
B Disconnect two electrical leads (4).

C Remove two screws (5), two flat washers (6) and two lockwashers (7). Discard lockwashers.

D Remove taillight assembly (8), grommet (9) and electrical leads (4) from hull.

TA57155

RIGHT TAILLAMP ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

NOTE

Taillight does not have to be removed to service lamps.

A Loosen six screws (10) with six retaining rings (11).

B Separate door (12) and gasket (13) from body (14). Discard gasket.

C Push in two lamps (15), turn counterclockwise and remove.

D Remove two screws (16) and two lockwashers (17). Discard lockwashers.

E Remove three screws (18) and lamp holder (19) from body (14).

ASSEMBLY

A Position new lamp holder (19) in body (14) and secure with three screws (18).

B Install two screws (16) and two new lockwashers (17).

C Install lamps (15) and turn clockwise until seated.

D Install door (12) and new gasket (13) with six screws (10) and six retaining rings (11).

INSTALLATION

A Install leads (4) through grommet (9) and hull.

B Install taillight assembly (8) with two screws (5), two flat washers (6), and two new lockwashers (7).

C Connect two electrical leads (4).

D Install four spacers (2), cover plate (3) and four screws (1).

TA57156

LEFT TAILLAMP ASSEMBLY: REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY AND INSTALLATION

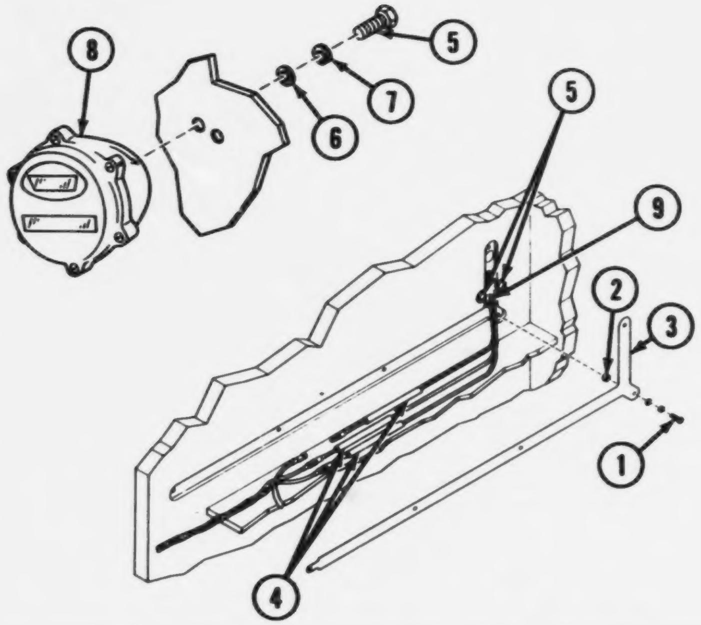
INITIAL SETUP

Personnel Required:

Two

Equipment Condition:

Left canister guard removed (p 11-16).
MASTER switch OFF.
Battery ground cables disconnected (6-44).



REMOVAL

NOTE

Be careful that spacers do not fall during removal.

A Remove five screws (1), five spacers (2), and cover plate (3).

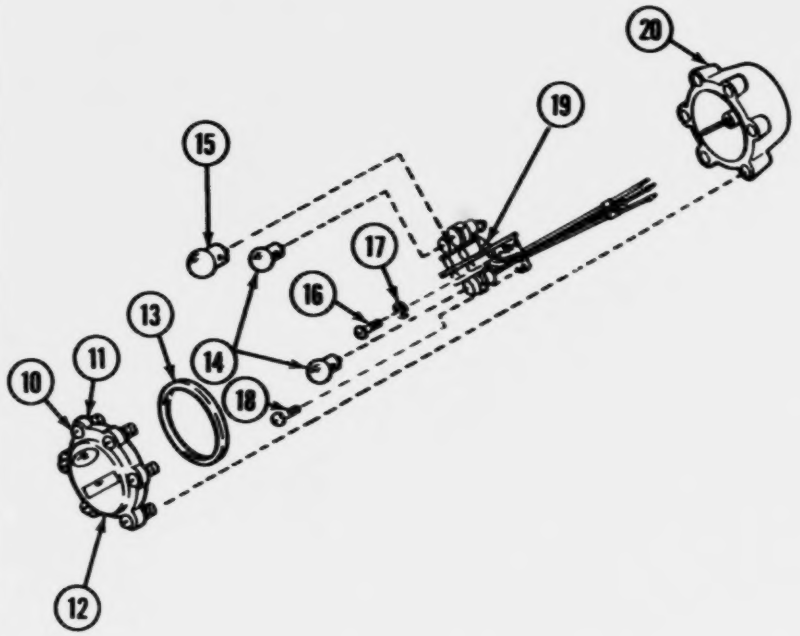
B Disconnect three electrical leads (4).

C Remove two screws (5), two flat washers (6) and two lockwashers (7). Discard lockwashers.

D Remove taillight assembly (8), grommet (9) and electrical leads (4).

TA57159

LEFT TAILLAMP ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

NOTE

Taillight does not have to be removed to service lamps.

A Loosen six screws (10) with retaining rings (11).

B Remove door (12) and gasket (13). Discard gasket.

C Push in two lamps (14 and 15). Turn lamps (14 and 15) counterclockwise and remove.

D Remove two screws (16) and two lockwashers (17). Discard lockwashers.

E Remove three screws (18) and lamp holder (19) from body (20).

ASSEMBLY

A Position new lamp holder (19) in body (20). Secure lamp holder (19) with three screws (18).

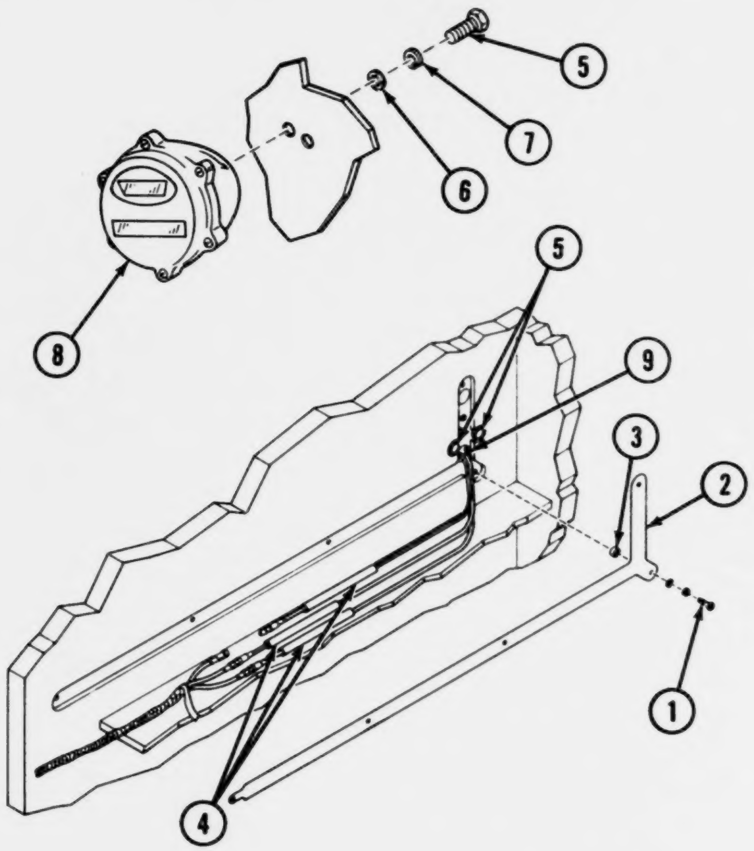
B Install two screws (16) and two new lockwashers (17).

C Position two lamps (14 and 15) on lamp holder (19). Push in on lamps (14 and 15) and turn clockwise until seated.

D Position door (12) and new gasket (13) with six screws (10) and six retaining rings (11).

TA57160 ■

LEFT TAILLAMP ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Install leads (4) through grommet (9) and hull.

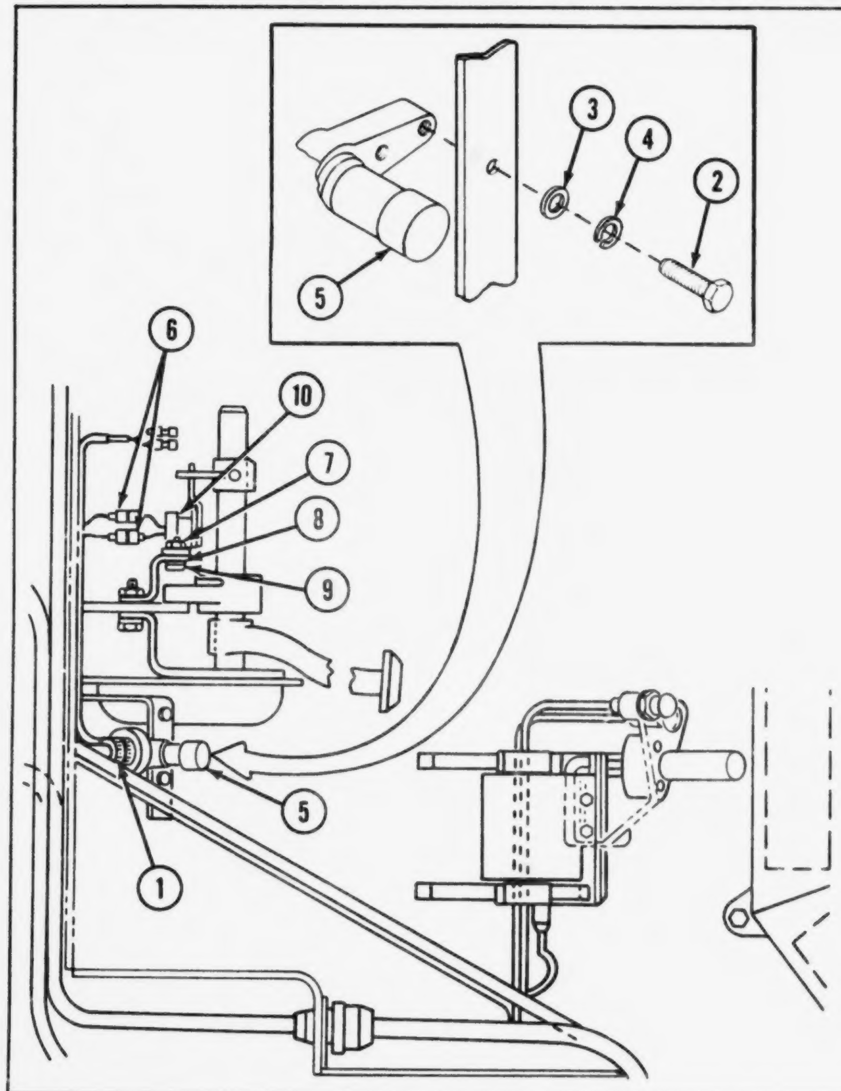
B Install taillight assembly (8) with two screws (5), two flat washers (6) and two new lockwashers (7).

C Connect three electrical leads (4).

D Install cover plate (3), five spacers (2), and five screws (1).

TA57161

HEADLIGHT DIMMER AND STOPLIGHT SWITCHES: REMOVAL, INSTALLATION AND ADJUSTMENT



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery cables.

A Disconnect electrical plug (1).

B Remove two screws (2), two flat washers (3) and two lockwashers (4).

C Remove dimmer switch (5).

D Disconnect two electrical connectors (6).

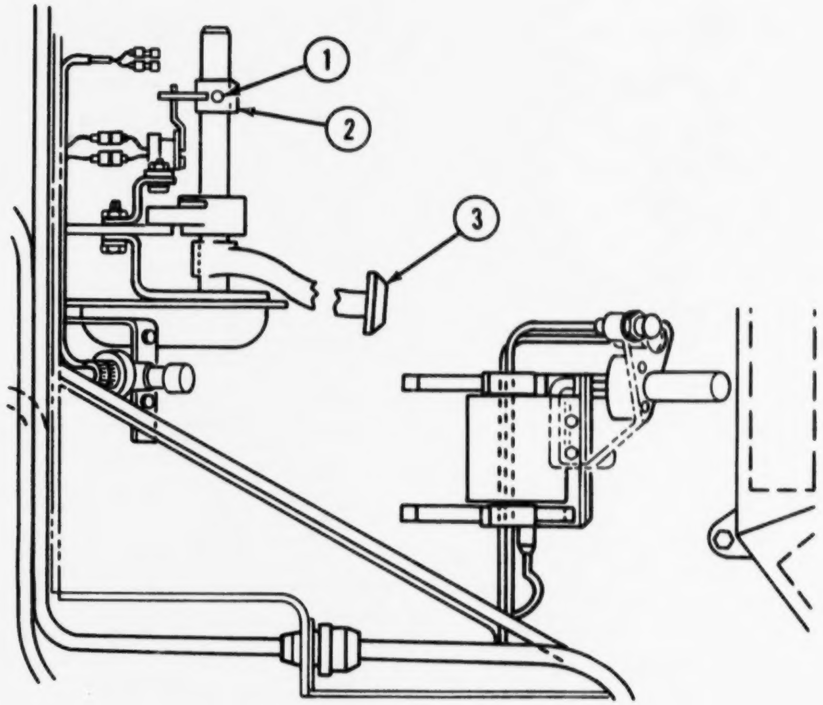
E Remove two nuts (7), two washers (8) and two screws (9).

F Remove stoplight switch (10).

INSTALLATION

Reverse removal procedures.

TA311069



ADJUSTMENT

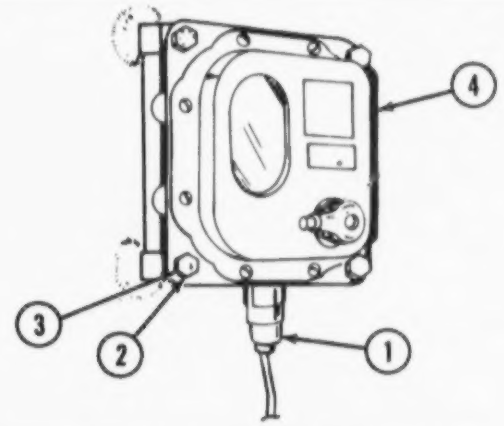
A Loosen setscrew (1).

B Slide actuator (2) right or left so stoplights are on when brake pedal (3) is depressed approximately 3/4 inch.

C Tighten setscrew (1).

TA311070

DOMELIGHT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



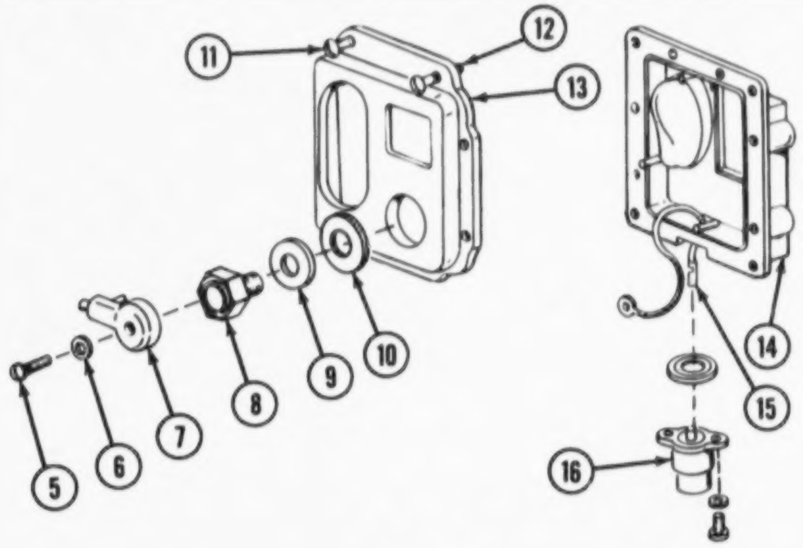
REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect electrical lead (1).

B Remove four screws (2) and four lockwashers (3) and dome light (4).



DISASSEMBLY

A Remove screw (5), lockwasher (6), switch knob (7), nut (8), gasket (9) and flat washer (10).

B Loosen eight screws (11) with retaining rings (12).

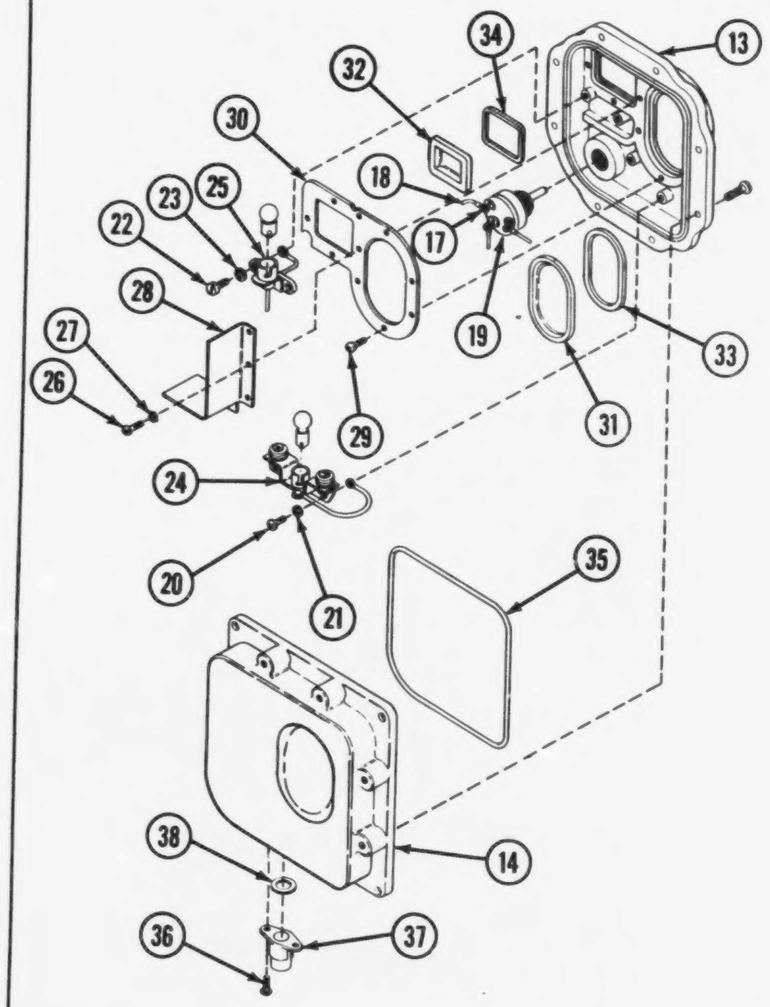
C Separate dome light door assembly (13) from light body (14).

D Disconnect electrical lead (15) from connector assembly (16).

E Remove door assembly (13) from body (14).

TA311071

DOMELIGHT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



F Remove three screws (17) and three electrical leads (18) from switch (19).

G Remove switch (19).

H Remove two crosspoint screws (20), two lockwashers (21), two screws (22), two flat washers (23) and lamp assemblies (24 and 25) from door (13).

I Remove four crosspoint screws (26), four lockwashers (27) and partition (28).

J Remove four crosspoint screws (29), plate (30), lens (31), lens (32), gaskets (33, 34 and 35) from door assembly (13).

K Remove two crosspoint screws (36), connector assembly (37) and grommet (38) from dome light body (14).

ASSEMBLY

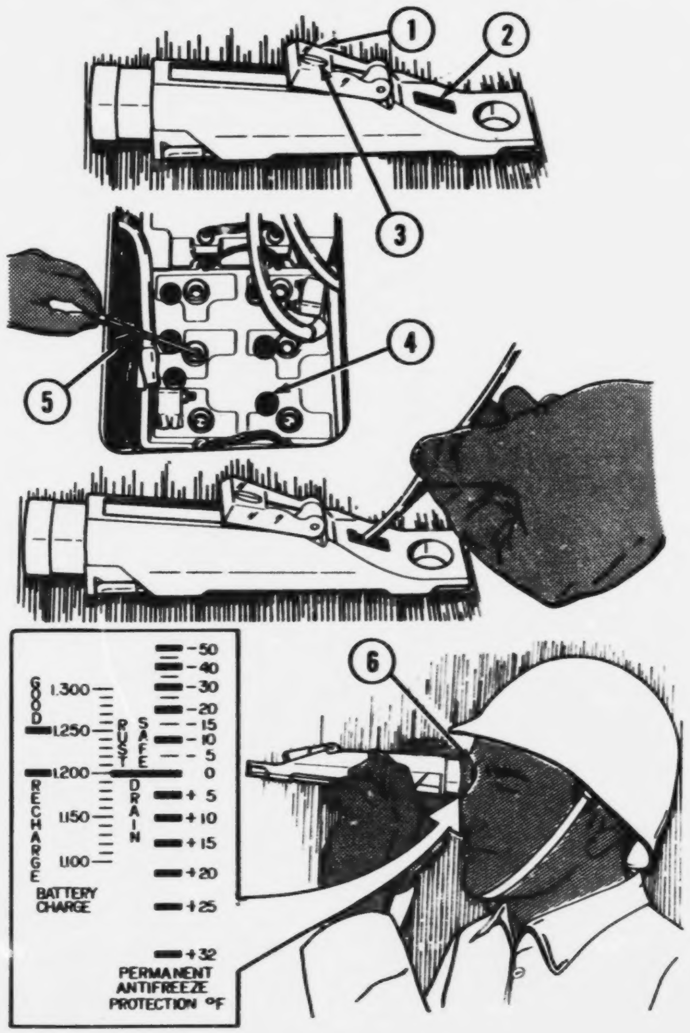
Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

TA311072

BATTERIES: BATTERY SPECIFIC GRAVITY CHECK, REMOVAL AND INSTALLATION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+25
+32
PERMANENT ANTIFREEZE PROTECTION °F

SPECIFIC GRAVITY CHECK

WARNING

Set MASTER switch OFF. When working on batteries, wear eye protection, remove all jewelry, dog tags and metal items.

CAUTION

When removing batteries always disconnect ground cables first.

A Swing plastic cover (1) back on duo-check coolant and battery tester. Clean measuring surface (2) and bottom cover (3) with clean soft cloth (item 16, Appx D).

B Remove battery caps (4) from all cells.

NOTE

Repeat steps B through D for each cell.

C Use black dipstick (5) to obtain small sample of battery acid.

D Place few drops of acid onto measuring surface (2) through opening in cover plate.

TA311073

BATTERIES: BATTERY SPECIFIC GRAVITY CHECK, REMOVAL AND INSTALLATION (CONTINUED)

WARNING

Do not look into the infrared (blackout) light. If using headlight as a light source, look into white light only. Infrared light can damage the eyes.

E Point instrument toward any light source (headlight) and look into eyepiece (6). Battery charge is at point on left-hand part of scale where dividing line between light and dark (shadow) crosses line.

NOTE

A little experience will enable you to obtain quickly the best contrast between light and dark positions of field of view. Tilt instrument toward light source until best results are obtained. If edge of shadow is not sharp, measuring surface was not sufficiently cleaned or dried.

TA311074

BATTERIES: REMOVAL AND INSTALLATION

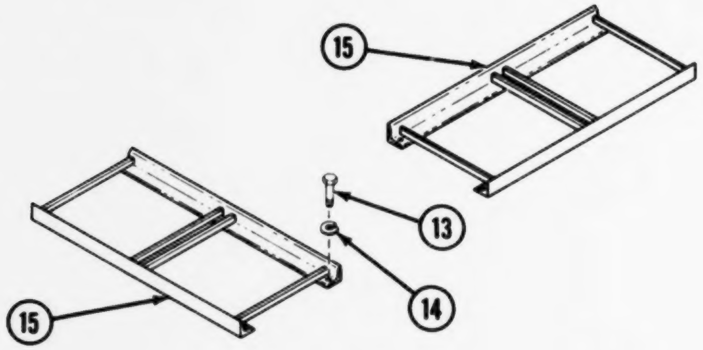
INITIAL SETUP

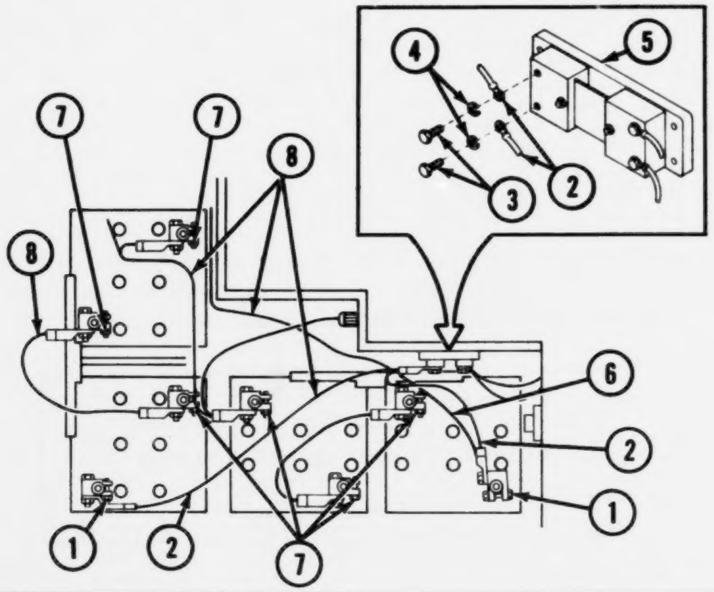
Equipment Condition:

MASTER switch OFF.

General Safety Instructions:

Make sure MASTER switch is OFF.
Wear eye protection.
Remove all jewelry, dog tags and metal items.

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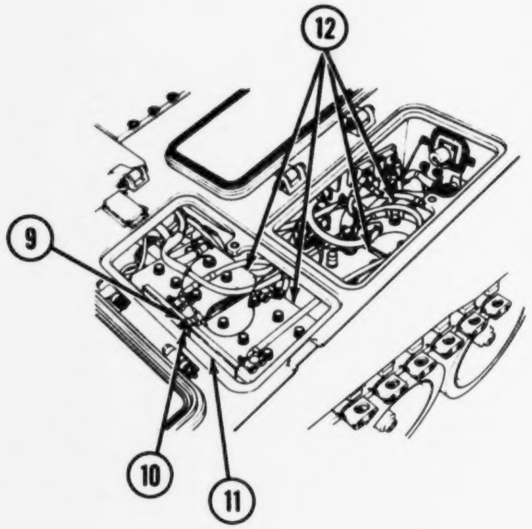


TA57162

BATTERIES: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

WARNING

When removing batteries, always disconnect ground cables first. Failure to do so may result in personnel injury or death.

NOTE

Remove cables with terminal lugs attached.

A Loosen two nuts (1) and remove two ground cables (2) from battery terminals.

B Remove two screws (3), two lockwashers (4) and two ground cables (2) from shunt (5). Discard lockwashers.

C Disconnect STE/ICE wire (6).

D Loosen six nuts (7) and remove four cables (8) from battery terminals.

E Remove two nuts (9) and two washers (10), and remove two hold-down brackets (11).

F Lift out batteries (12).

G Remove eight screws (13), eight lockwashers (14) and two battery trays (15). Discard lockwashers.

INSTALLATION

A Install eight screws (13), eight new lockwashers (14) and two battery trays (15).

B Install batteries (12).

C Install two nuts (9), two washers (10), and two hold-down brackets (11).

D Install four cables (8) to battery terminals and tighten six nuts (7).

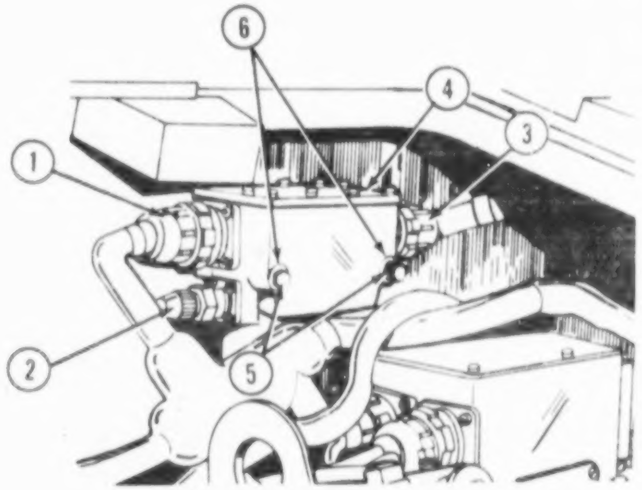
E Connect STE/ICE wire (6).

F Install two screws (3), two new lockwashers (4) and two ground cables (2) to shunt (5).

G Install two ground cables (2) to battery terminals and tighten two nuts (1).

TA57163

MASTER RELAY BOX: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect starter cable (1), master switch cable (2) and battery cable (3) from master relay box (4).

B Remove two screws (5) and washers (6).

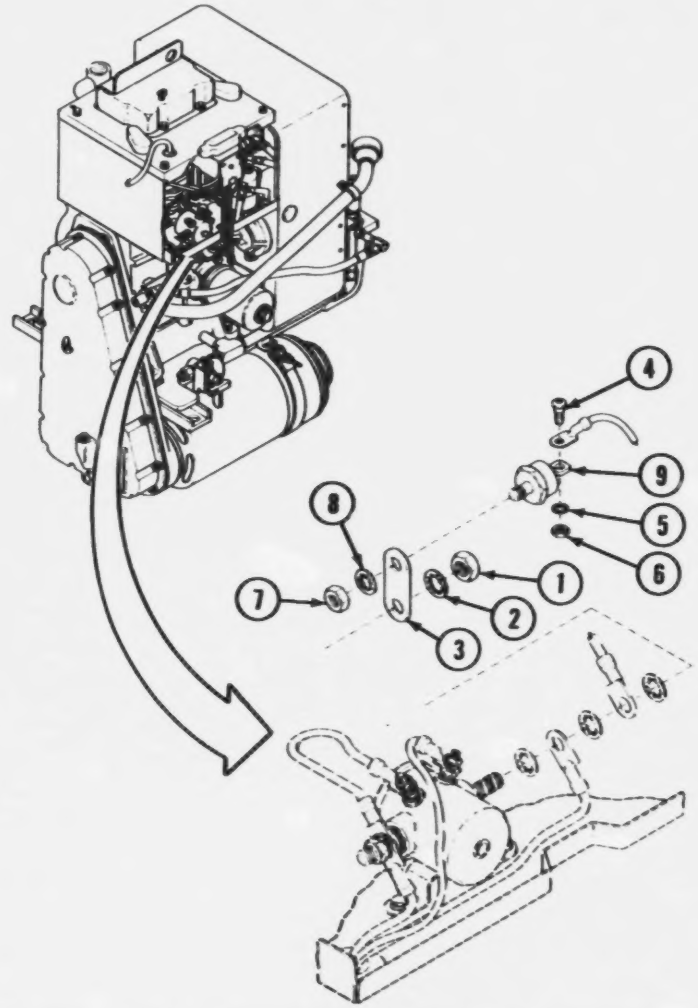
C Remove master relay box (4).

INSTALLATION

Reverse removal procedures.

TA311076

APU DIODE: REMOVAL AND INSTALLATION



REMOVAL

> **WARNING**
>
> Turn OFF MASTER switch. Disconnect battery ground cables.

A Move left projectile rack (TM 9-2350-267-10).

B Remove APU access plate (p 13-13).

C Remove cylinder shroud door panel.

D Remove nut (1) and lockwasher (2), and remove support (3).

E Remove screw (4), lockwasher (5), nut (6) and circuit-S wire.

F Remove nut (7) and lockwasher (8) securing diode (9) to support (3).

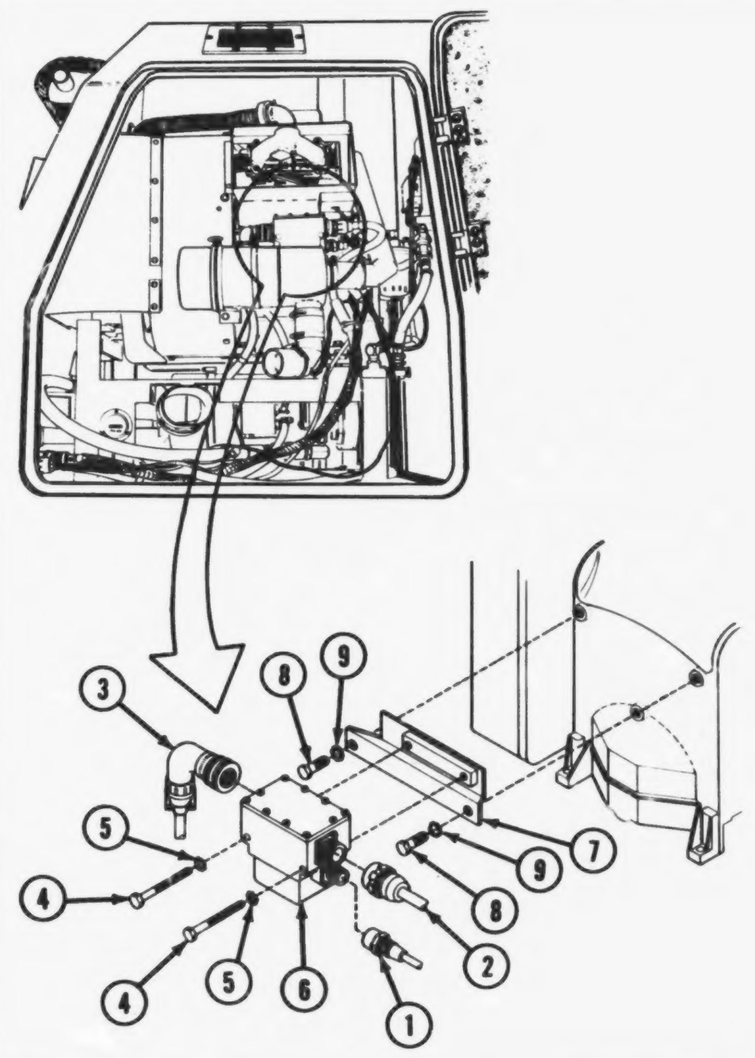
INSTALLATION

A Seal all exposed terminals with silicone adhesive sealant (item 5, Appx D).

B Reverse removal procedures.

TA311079

APU STARTER RELAY: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect cable assemblies (1, 2 and 3).

B Remove two screws (4) and two lockwashers (5) that secure relay assembly (6) to support (7).

C Remove two screws (8) and two lockwashers (9) that secure support (7) to APU.

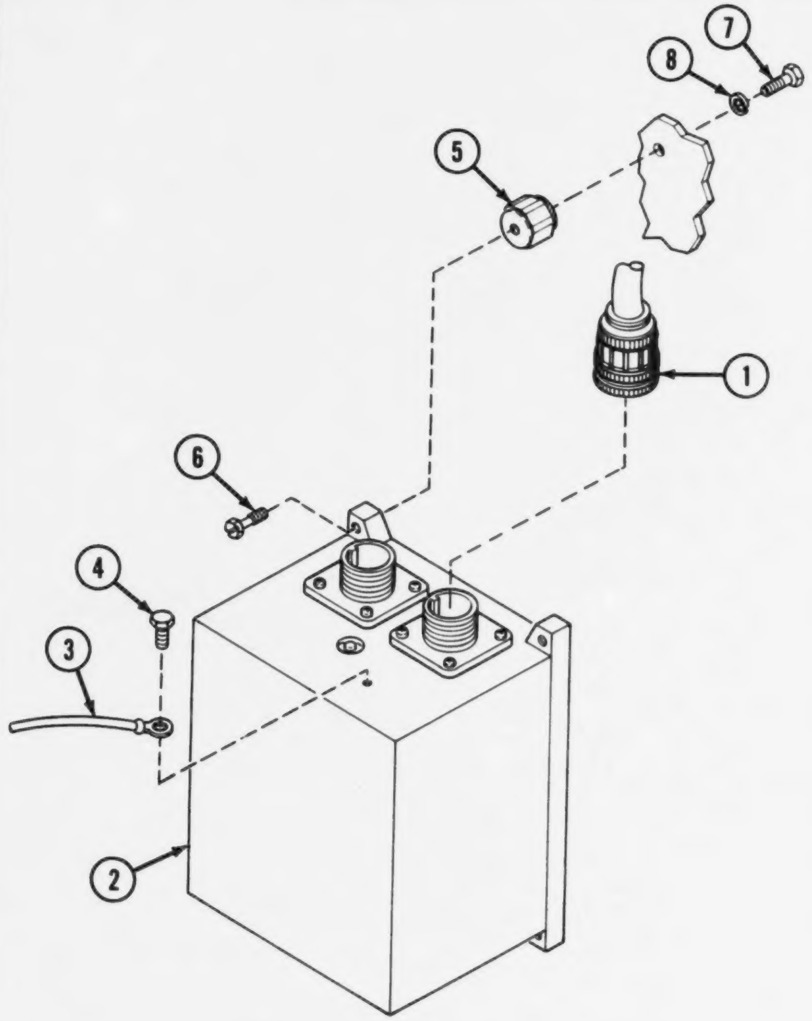
INSTALLATION

A Reconnect cable assemblies.

B Reverse removal procedures.

TA311080

APU VOLTAGE REGULATOR: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect two electrical plugs (1) from APU voltage regulator (2).

B Remove ground wire (3) from APU voltage regulator (2) by removing screw (4).

C Remove APU voltage regulator (2) from four standoff insulators (5) by turning four screws (6) counterclockwise until free of insulators.

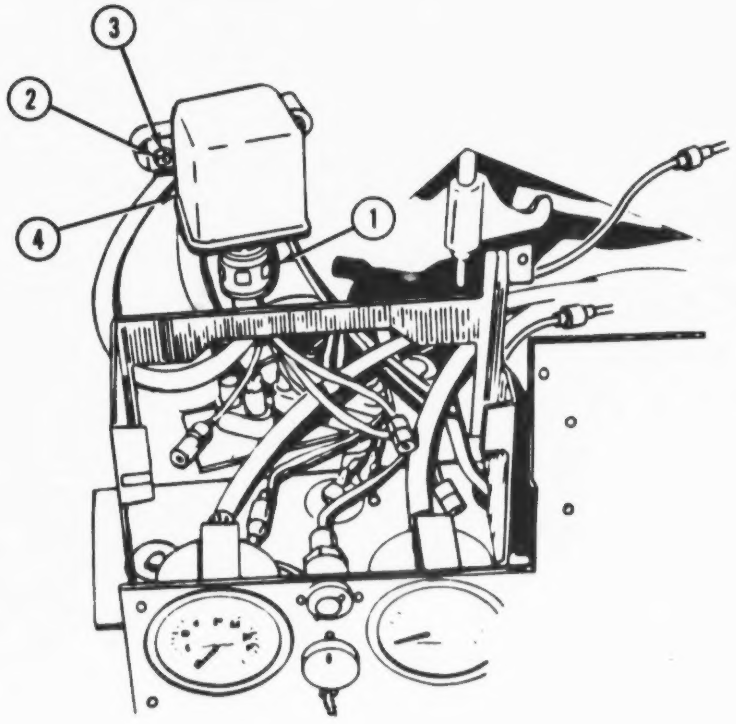
D Remove four insulators (5) from APU bulkhead by removing one screw (7) and one lockwasher (8) from each insulator (5).

INSTALLATION

Reverse removal procedures.

TA311081

AIR CLEANER BLOWER MOTOR RELAY: REMOVAL AND INSTALLATION



DRIVER'S COMPARTMENT
(INSTRUMENT PANEL)

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove driver's portable instrument panel (p 6-19).

B Disconnect electrical connector (1).

C Remove three nuts (2) and three washers (3).

D Remove air cleaner blower relay (4).

INSTALLATION

Reverse removal procedures.

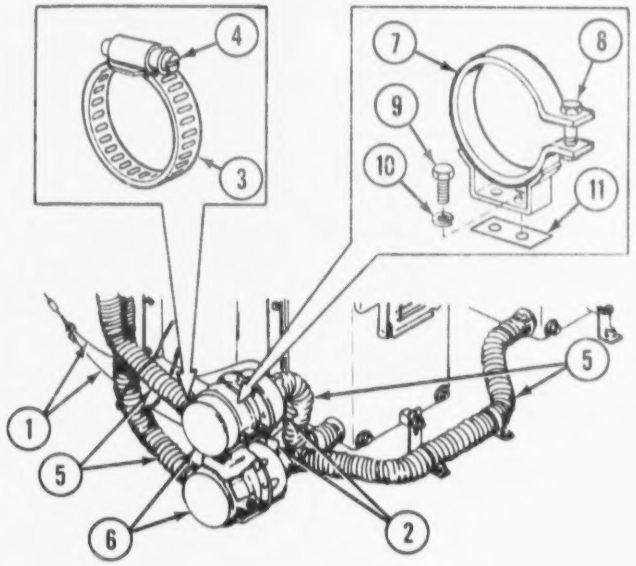
TA311082

AIR CLEANER BLOWER MOTORS: REMOVAL AND INSTALLATION

INITIAL SETUP

References:

TM 9-2350-267-10



CREW COMPARTMENT
(HULL FORWARD BULKHEAD)

REMOVAL

A Move right projectile rack to rear of vehicle (TM 9-2350-267-10).

B Disconnect two electrical leads (1) and two ground leads (2).

C Loosen four clamps (3) by turning four screws (4).

D Disconnect four hoses (5) from blower motors (6).

E Loosen two clamps (7) by turning two screws (8).

F Pull two blower motors (6) out of two clamps (7) and remove.

G Remove two clamps (7) by removing from each: two screws (9), two lockwashers (10) and gasket (11). Discard lockwashers and gaskets.

INSTALLATION

A Install two clamps (7) with new gasket (11), two screws (9) and two new lockwashers (10).

B Install two blower motors (6) in two clamps (7) and secure by tightening two screws (8).

C Connect four hoses (5) to blower motors (6).

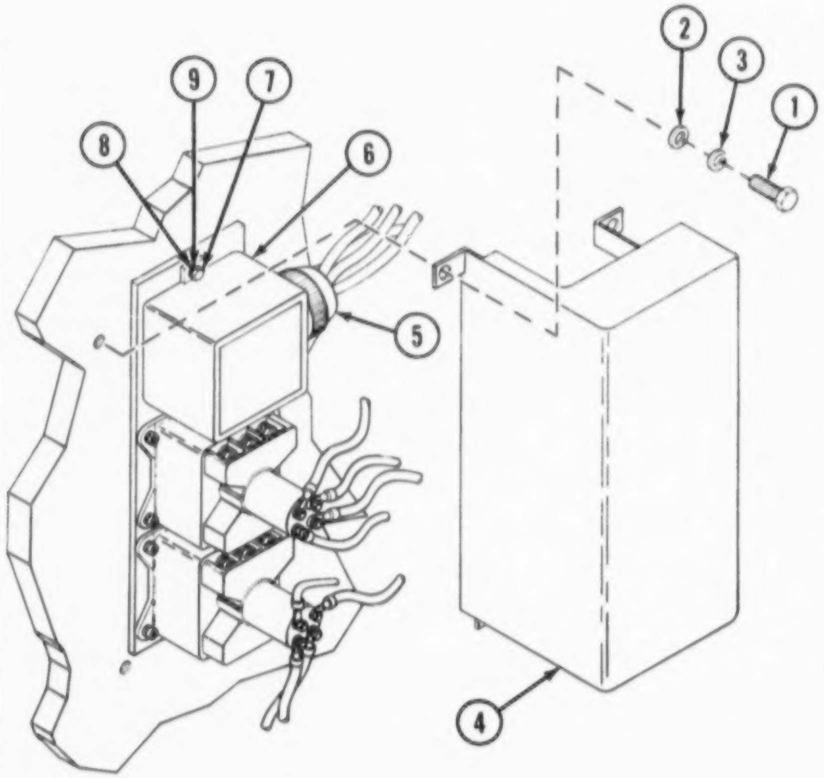
D Tighten four clamps (3) by turning four screws (4).

E Connect two ground leads (2) and two electrical leads (1).

F Move right projectile rack to front of vehicle (TM 9-2350-267-10).

TA312801

VENTILATION BLOWER RELAY: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove four screws (1), four flat washers (2) and four lockwashers (3).

B Remove relay cover (4).

C Disconnect electrical harness plug (5) from relay (6).

D Remove two screws (7), two flat washers (8) and two lockwashers (9).

E Remove relay (6).

INSTALLATION

Reverse removal procedures.

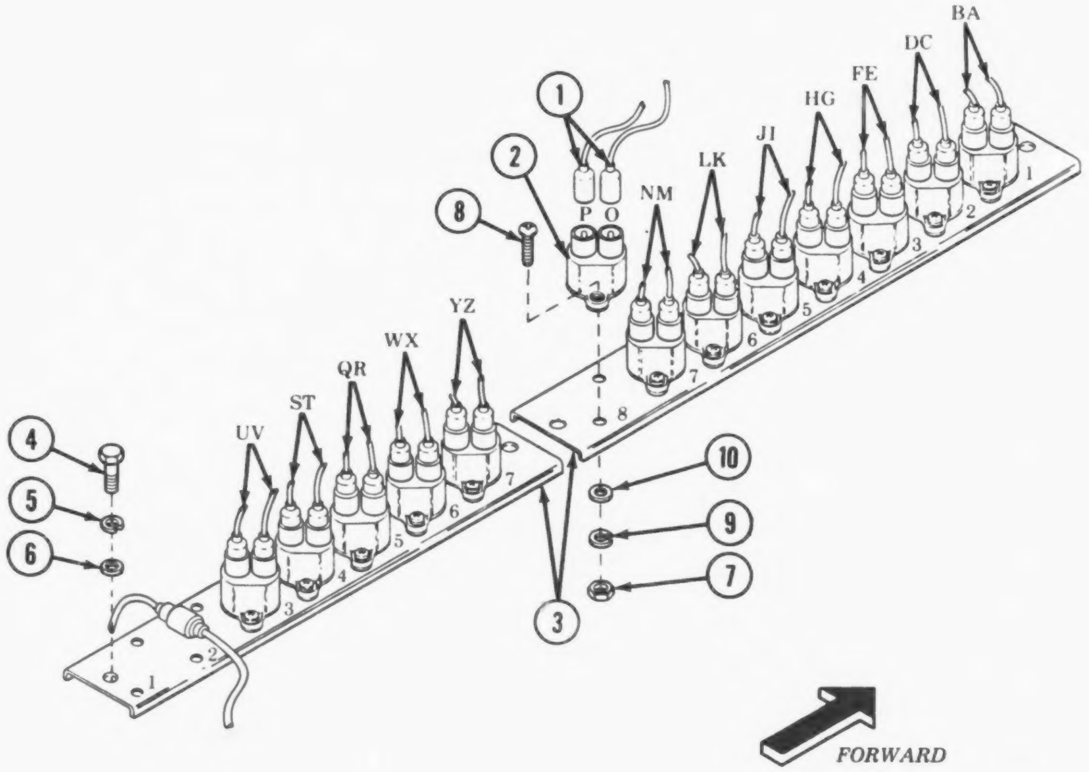
TA311084

CIRCUIT BREAKER PANELS AND CIRCUIT BREAKERS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

LEGEND

A - Harness, 12330252, wire 37-38
B - Harness, 12330257, wire 10A
C - Harness, 12268104, wire 450
D - Harness, 12330257, wire 10B
E - Harness, 12260287, wire 27
F - Harness, 12330257, wire 10C
G - Harness, 12268104, wire 458
H - Harness, 12330257, wire 10D
I - Harness, 12330252, wire 76
J - Harness, 12330257, wire 10E
K - Harness, 12351544, wire 415
L - Lead, 11682358, wire 415
M - Harness, 12268104, wire 10
N - Harness, 12330257, wire 10F
O - Harness, 12330252, wire 419
P - Harness, 12330257, wire 10G
Q - Harness, 12330257, wire 10J
R - Harness, 12330252, wire 38, 27, 40
S - Harness, 12330257, wire 10K
T - Harness, 12330252, wire 10
U - Harness, 12351531, wire 10M
V - Harness, 12351461, wire 10
W - Harness, 12351754, wire 10
X - Harness, 12351461, wire 10A
Y - Harness, 12330257, wire 10H
Z - Harness, 12330316, wire 10

1 Harness electrical connectors
2 Circuit breaker (13)
3 Circuit breaker panels (2)
4 Screw (4)
5 Lockwasher (4)
6 Flat washer (4)
7 Nuts (26)
8 Screw (26)
9 Lockwashers (26)
10 Flat washers (26)



TA57164

CIRCUIT BREAKER PANELS AND CIRCUIT BREAKERS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.
Portable instrument panel removed (p 6-19).
Driver's instrument panel removed (p 6-19).

REMOVAL

A Disconnect 26 electrical leads (1) from 13 circuit breakers (2).

B Remove two panels (3) from driver's compartment by removing four screws (4), four lockwashers (5) and four flat washers (6). Discard lockwashers.

DISASSEMBLY

Remove circuit breakers (2) from panels (3) by removing two nuts (7), two screws (8), two lockwashers (9) and two flat washers (10). Discard lockwashers.

ASSEMBLY

Install circuit breakers (2) to panels (3) by installing two nuts (7), two screws (8), two new lockwashers (9) and two flat washers (10).

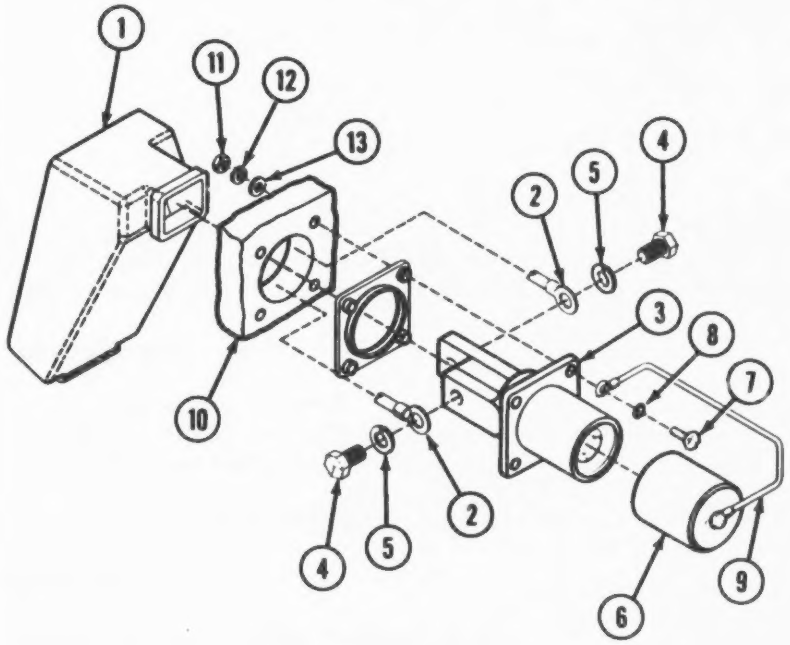
INSTALLATION

A Install four screws (4), four new lockwashers (5), two flat washers (6) and two panels (3) to driver's compartment.

B Install 26 electrical leads (1) to 13 circuit breakers (2).

TA57165

NATO INTERVEHICLE SLAVE CONNECTOR: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

The following procedures apply to both battery compartment and rear plate mounted intervehicle slave connectors.

A Pull back rubber boot (1) to expose electrical leads (2).

B Disconnect two electrical leads (2) from connector (3) by removing from each lead, one screw (4) and one lockwasher (5).

C Remove rubber boot (1).

D Pull off cover (6) from connector (3).

E For rear NATO receptacle, remove four screws (7) and four lockwashers (8) that secure cord (9) and connector (3) to hull rear plate (10).

or

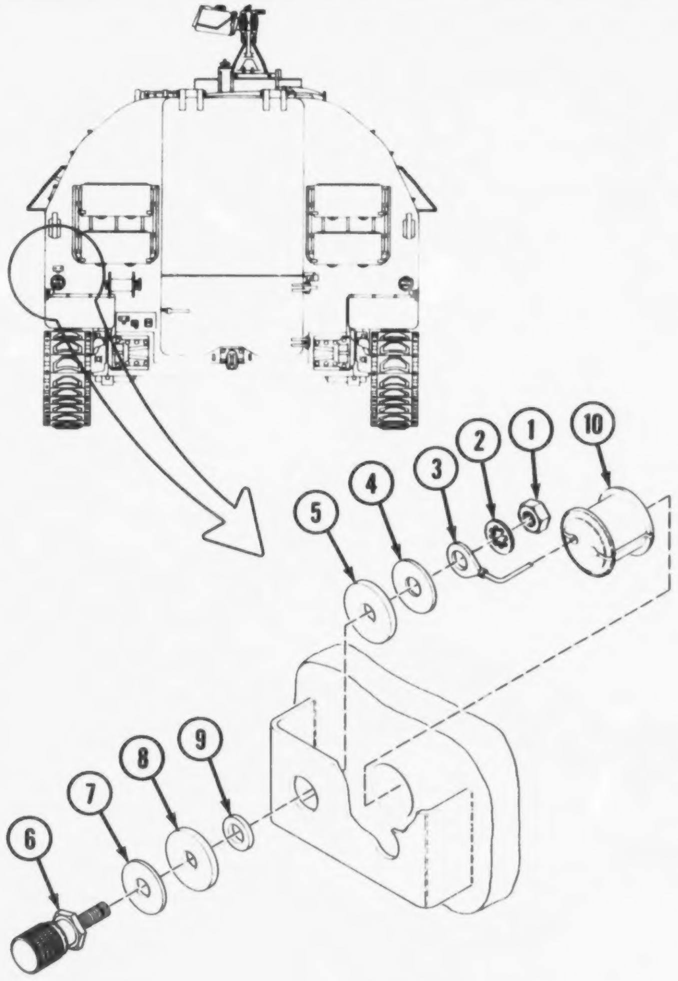
For battery compartment NATO receptacle, remove four screws (7), four nuts (11), four lockwashers (12), four flat washers (13) and cord (9) from rear plate (10).

INSTALLATION

Reverse removal procedures.

TA311087

INTERCOM TERMINALS: REMOVAL AND INSTALLATION



NOTE

Removal and installation procedures for both intercom terminals are identical.

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove nut (1) and lockwasher (2). Discard lockwasher.

B Remove cable (3), flat washer (4) and nonmetallic washer (5).

C Remove telephone terminal (6), flat washer (7), nonmetallic washer (8), flat washer (9) and grommet (10). Discard nonmetallic washer.

INSTALLATION

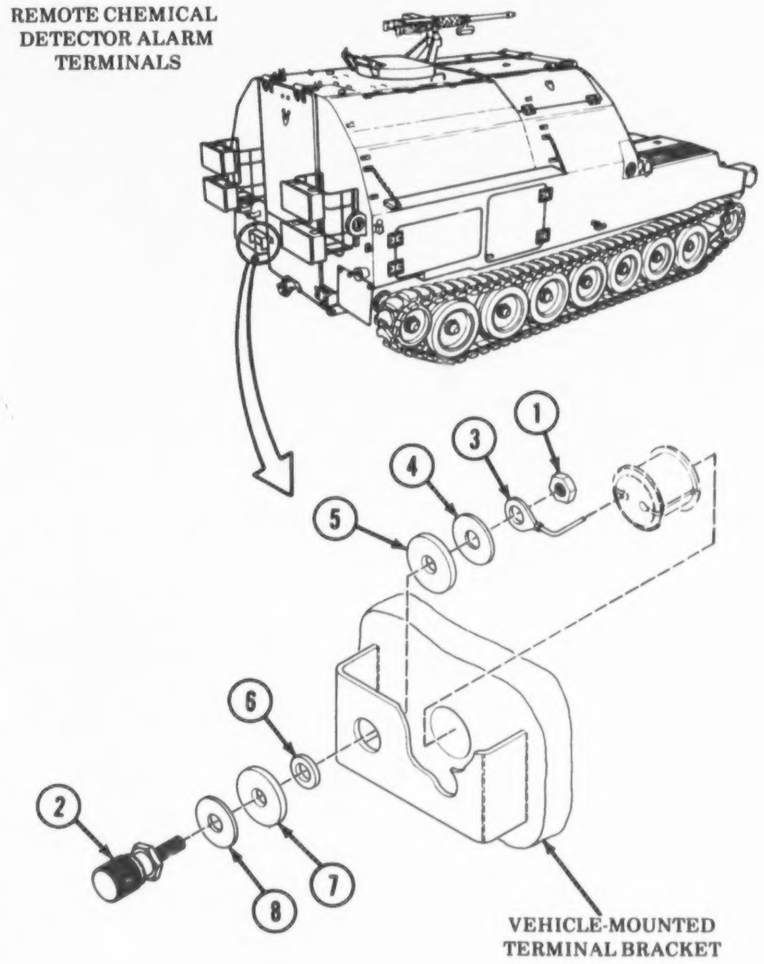
A Install telephone terminal (6) with grommet (10), flat washer (9), new nonmetallic washer (8) and flat washer (7).

B Install cable (3) with new nonmetallic washer (5) and flat washer (4).

C Install new lockwasher (2) and nut (1).

TA312802

REMOTE CHEMICAL DETECTOR ALARM TERMINALS: REMOVAL AND INSTALLATION


REMOTE CHEMICAL DETECTOR ALARM TERMINALS
1
3
4
5
6
2
7
8
VEHICLE-MOUNTED TERMINAL BRACKET

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

There are two pairs of terminals. Each pair is installed on a vehicle-mounted bracket. Each terminal is removed and installed in the same way. These procedures cover only one terminal.

A Remove nut (1) from terminal (2).

B Remove cable connector (3).

C Remove flat metal washer (4) and insulating washer (5).

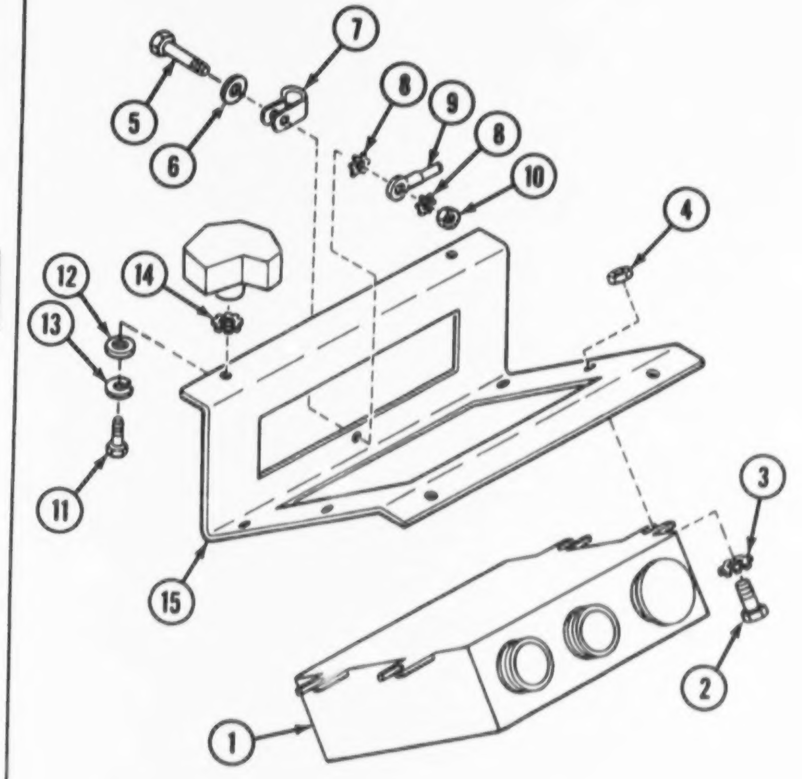
D Pull terminal (2) out of vehicle-mounted bracket along with insulating washers (6 and 7) and flat metal washer (8).

INSTALLATION

Reverse removal procedures.

TA311089

INTERCOM POWER SUPPLY BRACKET: REMOVAL AND INSTALLATION



REMOVAL

A Disconnect cable connectors from intercom power supply (1) as necessary.

B Remove four screws (2), four lockwashers (3) and four nuts (4). Discard lockwashers.

C Remove power supply (1).

D Remove screw (5), flat washer (6), tiedown strap (7), two lockwashers (8), ground wire (9) and nut (10). Discard lockwashers.

E Remove four screws (11), four flat washers (12), four lockwashers (13) and four lockwashers (14). Discard lockwashers.

F Remove intercom power supply bracket (15).

INSTALLATION

A Install intercom power supply bracket (15) with four new lockwashers (14), four new lockwashers (13), four flat washers (12) and four screws (11).

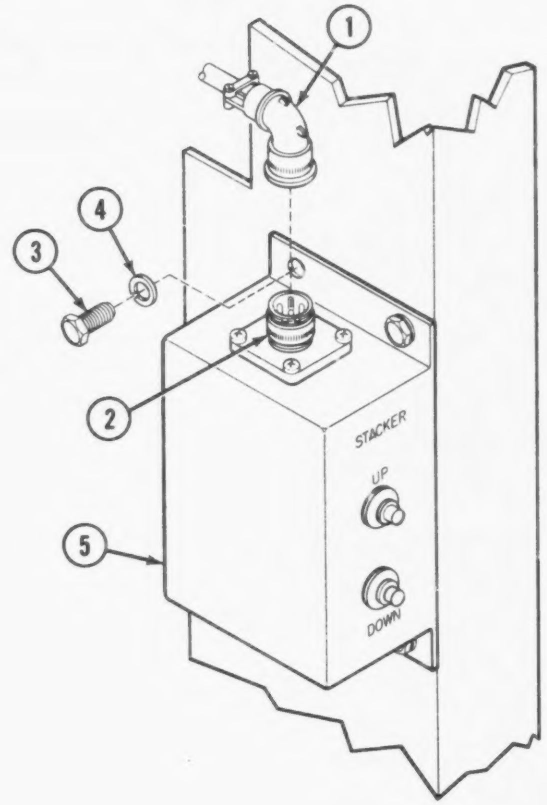
B Install nut (10), ground wire (9), two new lockwashers (8), tiedown strap (7), flat washer (6) and screw (5).

C Install intercom power supply (1) with four nuts (4), four new lockwashers (3) and four screws (2).

D Connect cable connectors to intercom power supply (1) as necessary.

TA57166

STACKER CONTROL SWITCH BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

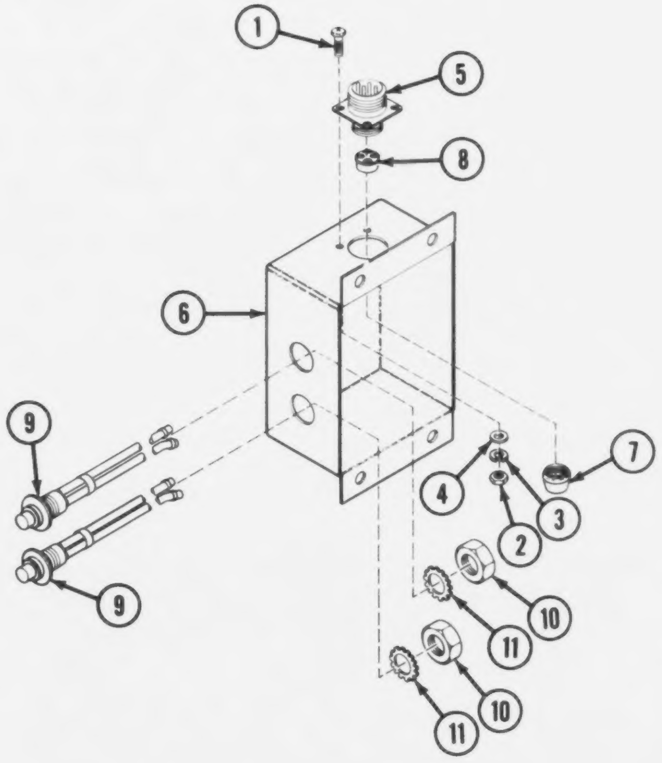
A Disconnect electrical wiring harness plug (1) from control box receptacle (2).

B Remove four screws (3) and four lockwashers (4).

C Remove switch box (5) from stacker outer guard.

TA312804

STACKER CONTROL SWITCH BOX: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove four screws (1), four nuts (2), four lockwashers (3) and four flat washers (4).

B Remove receptacle (5) from box (6), unscrew retaining nut (7) and pull rubber grommet (8) from receptacle (5).

C Push four pin sockets, on ends of switch (9) wires, from receptacle (5).

D Remove rubber grommet (8) and retaining nut (7) from switch (9) wires.

E Remove two switches (9) from box (6) by removing from each, one nut (10) and one lockwasher (11).

ASSEMBLY

NOTE

Seal all bare wires with silicone adhesive sealant (item 5, Appx D).

A Locate pin sockets of switch (9) wires in receptacle (5) using the following chart as a guide.

WIRE NO	PIN LOCATION	SWITCH
AAE	C	DOWN
10	D	
AAD	A	UP
10	B	

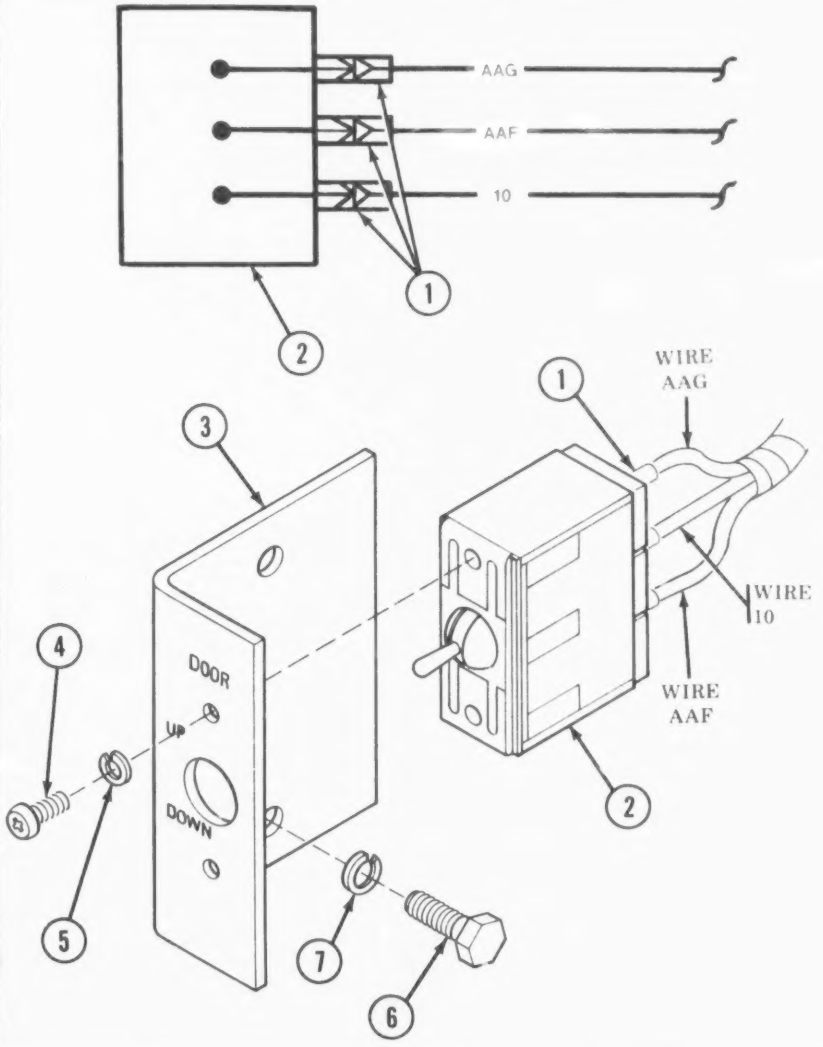
B Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

TA311091

UPPER REAR DOOR CONTROL SWITCHES: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

The following procedures can be used to remove both upper and lower control switches.

A Disconnect three electrical harness connectors (1) from door control toggle switch (2).

B Remove toggle switch (2) from bracket (3) by removing two screws (4) and lockwashers (5).

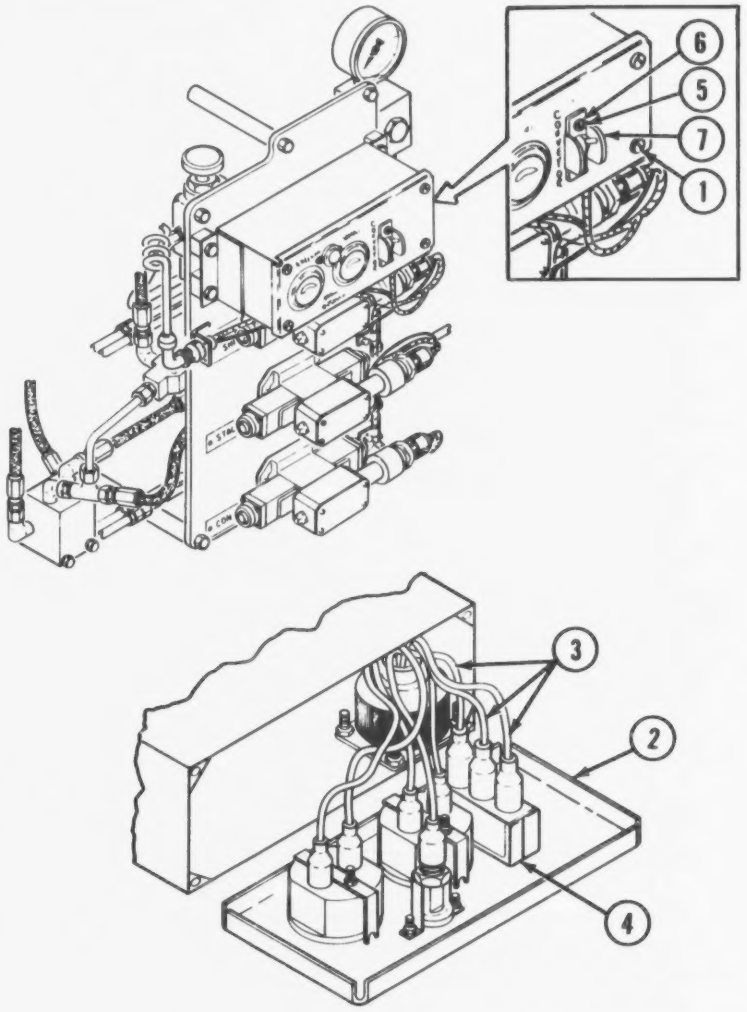
C Remove switch bracket (3) from vehicle by removing two screws (6) and two lockwashers (7).

INSTALLATION

Reverse removal procedures.

TA311092

CONVEYOR CONTROL SWITCH: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Turn four retaining studs (1) and open gage panel cover (2).

B Disconnect three harness connectors (3) from conveyor control switch (4).

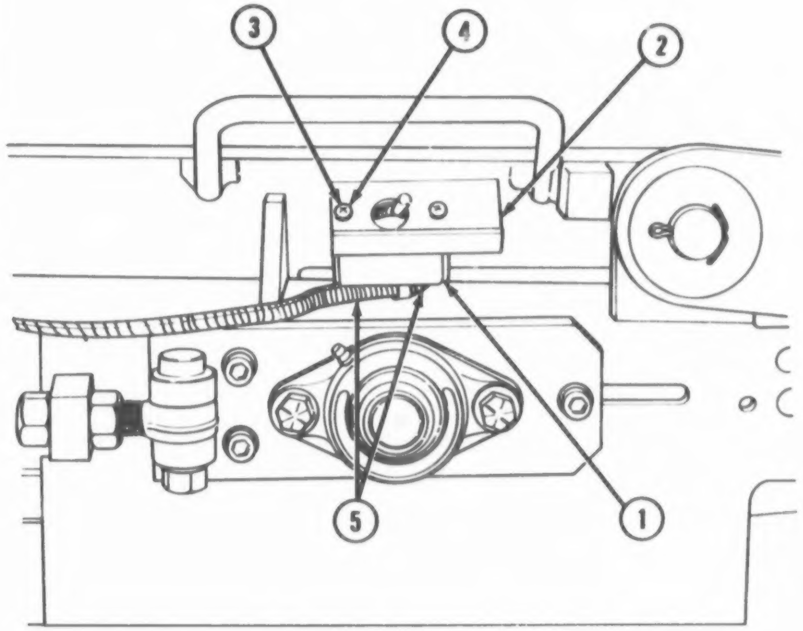
C Remove two screws (5), two lockwashers (6), switch (4) and guard (7).

INSTALLATION

Reverse removal procedures.

TA311093

CONVEYOR OVERRIDE SAFETY SWITCH: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove switch (1) from conveyor-mounted bracket (2) by removing two screws (3) and two lockwashers (4).

B Disconnect wiring harness leads (5) from switch (1).

INSTALLATION

Reverse removal procedures.

TA311094

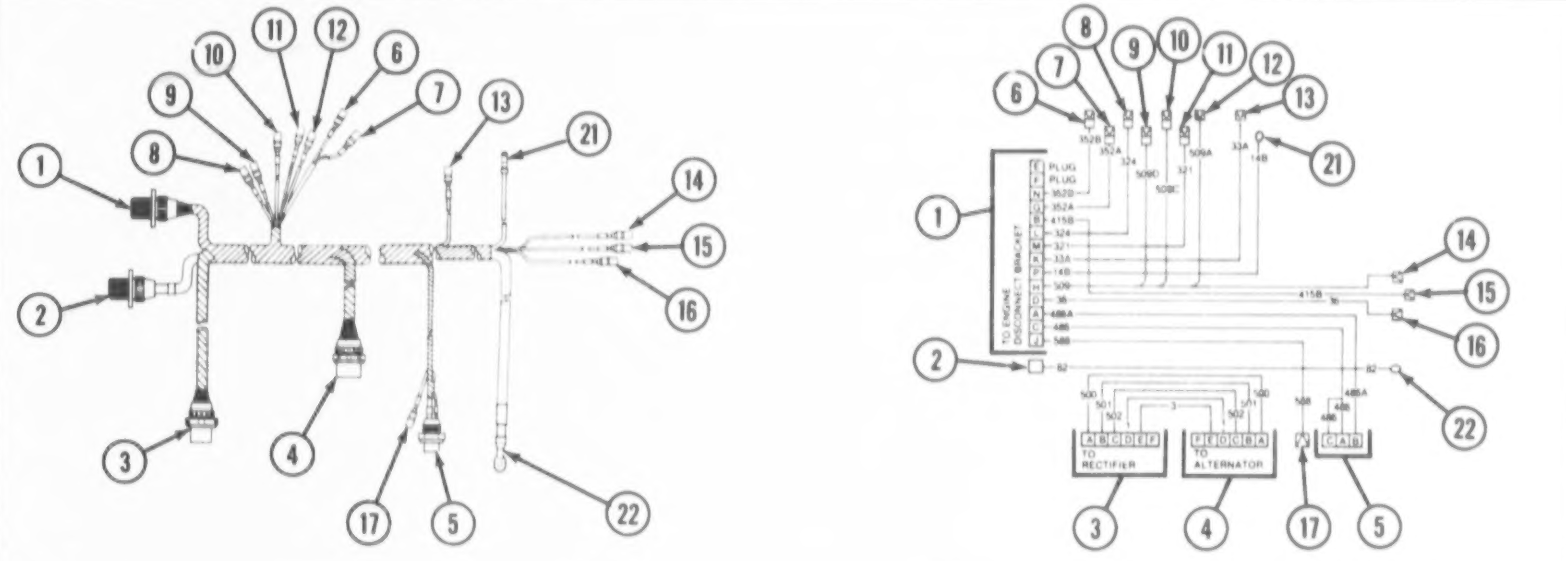
Section III POWERPACK AND HULL WIRING HARNESSES

NOTE

Each electrical cable is marked with a wire numbered metal tag attached to the junction of terminal of the cable. All electrical circuits shown in schematics and wiring diagrams are identified by wire numbers listed in each area.

Instructions for disassembly and assembly of individual wiring harnesses are contained in Chapters 2 and 3 of this manual.

POWERPACK WIRING HARNESS (12268102): REMOVAL, REPAIR AND INSTALLATION


1
2
3
4
5
6
7
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9
10
11
12
13
14
15
16
17
21
22
TO ENGINE DISCONNECT BRACKET
E PLUG
F PLUG
N 352B
G 352A
B 415B
L 324
M 321
R 33A
P 14B
H 509
D 36
A 486A
C 486
J 588
352B
352A
324
509D
509C
321
509A
33A
14B
415B
36
82
500
501
502
3
TO RECTIFIER
TO ALTERNATOR
A B C D E F
F E D C B A
588
486A
486
C A B

Connector Number	Electrical Lead To:	Wire No.
1	Master circuit harness connector	12268102
2	Starter cable connector	82
3	Rectifier connector	500, 501, 502, 1 and 3
4	Generator (Alternator) connector	500, 501, 502, 1 and 3
5	Flame heater system connector	486 and 486A
6	Low level coolant indicator	352B
7	Low level coolant indicator	352A
8	Transmission oil temperature transmitter	324
9	Transmission oil high temperature switch	509D
10	Transmission oil low pressure switch	509C

Connector Number	Electrical Lead To:	Wire No.
11	Transmission oil pressure transmitter	321
12	Engine coolant high temperature switch	509A
13	Engine coolant temperature transmitter	33A
14	Engine oil low pressure switch	509B
15	Air cleaner and regulator system relay switch	415B
16	Engine oil pressure transmitter	36
17	Fuel prime pump	588
21	Starter solenoid coil	14B
22	Starter solenoid lead	82

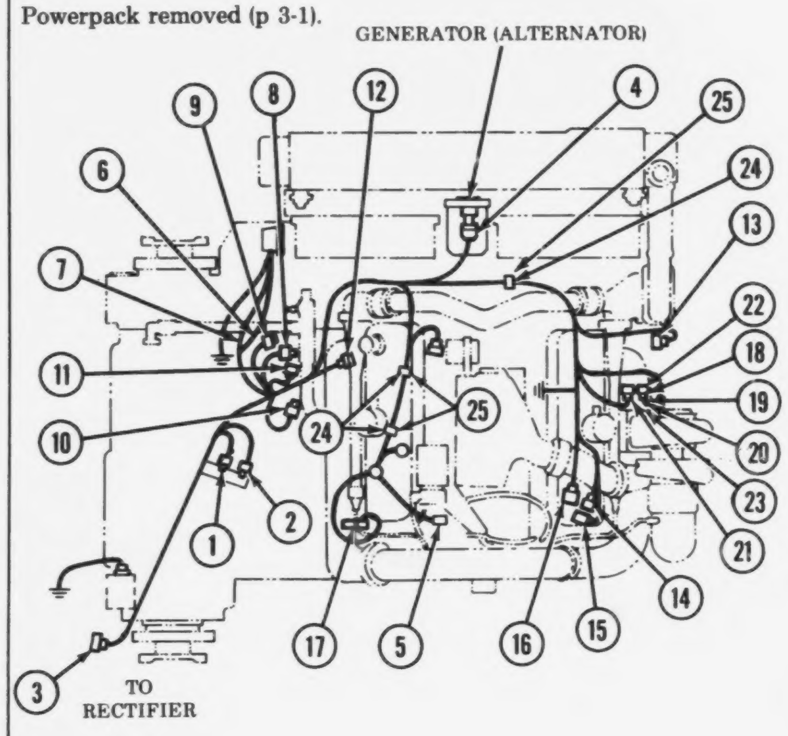
TA312805

POWERPACK WIRING HARNESS (12268102): REMOVAL, REPAIR AND INSTALLATION (CONTINUED)

INITIAL SETUP

Equipment Conditions:

Powerpack removed (p 3-1).



REMOVAL

A Disconnect five connectors (1, 2, 3, 4 and 5).

B Disconnect 12 connectors (6 thru 17).

C Remove two screws (18), four flat washers (19) and two nuts (20) to disconnect two leads (21 and 22) from starter solenoid (23).

D Remove three screws (24) and three clamps (25).

E Remove powerpack wiring harness.

REPAIR

NOTE

Remove electrical tape only from section of harness to be repaired.

A Remove section of electrical tape from harness.

B Isolate and separate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

INSTALLATION

A Install powerpack wiring harness.

B Install three clamps (25) and three screws (24).

C Connect two leads (21 and 22) to starter solenoid (23) with two screws (18), four flat washers (19) and two nuts (20).

D Connect 12 connectors (6 thru 17).

E Connect five connectors (1, 2, 3, 4 and 5).

TA312806

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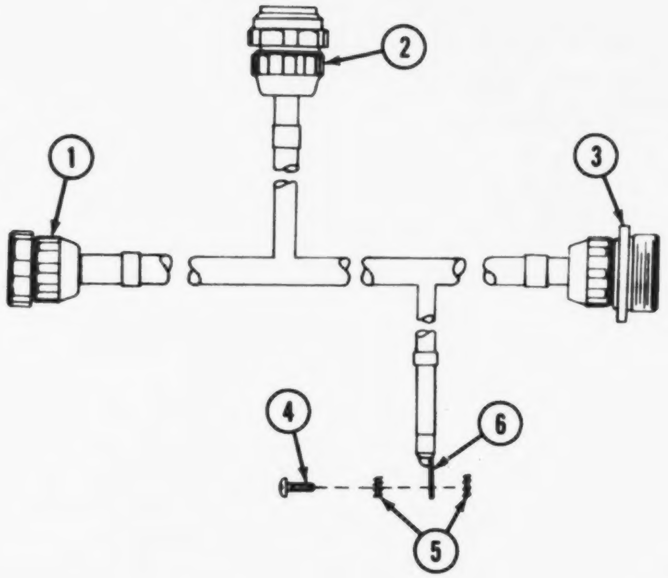
ENGINE BRACKET TO DRIVER'S BULKHEAD WIRING HARNESS (11593782): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground cables.

A Disconnect connector (1) from engine bracket receptacle.

B Disconnect connector (2) from master relay box.

C Disconnect connector (3) from driver's compartment bulkhead receptacle.

D Remove screw (4) and two lockwashers (5) securing terminal lug (6) to bottom of bilge pump relay box. Discard lockwashers.

E Remove wiring harness.

INSTALLATION

A Position wiring harness in engine compartment and battery compartment.

B Install terminal lug (6) to bottom of bilge pump relay box with screw (4) and two new lockwashers (5).

C Connect connector (3) to driver's compartment bulkhead receptacle.

D Connect connector (2) to master relay box.

E Connect connector (1) to engine bracket receptacle.

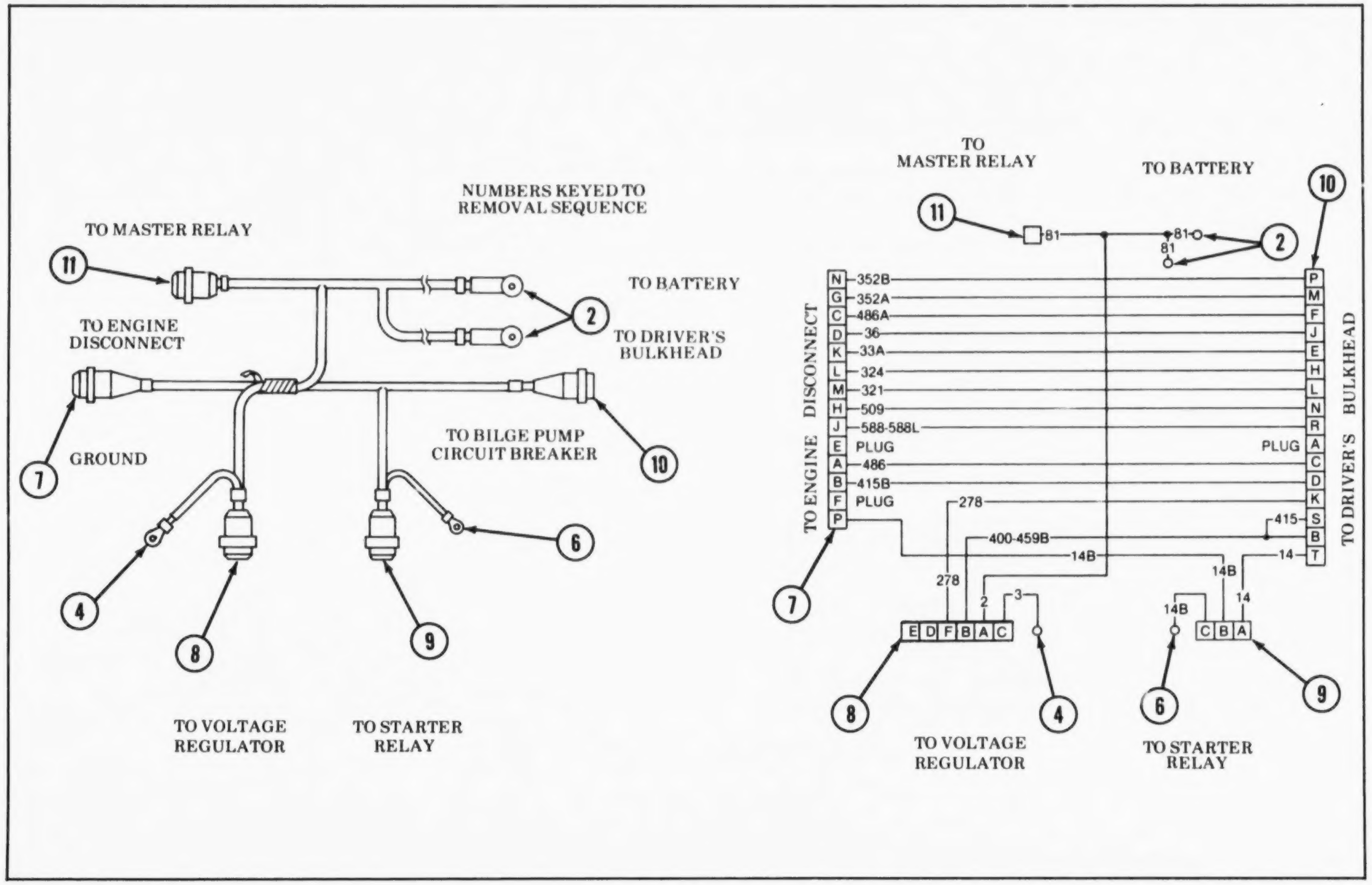
TA312807

ENGINE DISCONNECT BRACKET TO BULKHEAD WIRING HARNESS (12268100): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

Connector Number	Electrical Lead To:	Wire No.
2	Battery connectors	
4	Ground wire	
6	Bilge pump circuit breaker lead	
7	Engine bracket disconnect connector	
8	Voltage regulator connector	
9	Starter relay connector	
10	Driver's bulkhead connector	
11	Master relay connector	
	Battery assembly to master relay	81
	Aeration detector to coolant indicator	352B
	Aeration detector to coolant indicator	352A
	Flame heater to flame heater switch	486A
	Engine oil pressure transmitter to engine oil pressure gage switch	36
	Engine coolant temperature transmitter to engine water temperature gage	33A
	Transmission oil temperature transmitter to transmission oil temperature gage	324
	Transmission oil pressure transmitter to transmission oil pressure switch	321
	High/Low temperature and pressure switches/transmitters to master warning light	509
	Fuel prime pump to fuel prime pump switch	588
	Flame heater motor pump to flame heater master switch	486
	Air cleaner blower motor switch to air cleaner blower motor assembly	415B
	Regulator cutoff relay coil energizer	27B
	Air cleaner blower motor circuit	415
	Master switch to voltage regulator lead	400-459B
	Engine starter circuit (starter relay bilge pump circuit breaker, neutral safety switch)	14/14B
	Voltage regulator to master relay lead	2

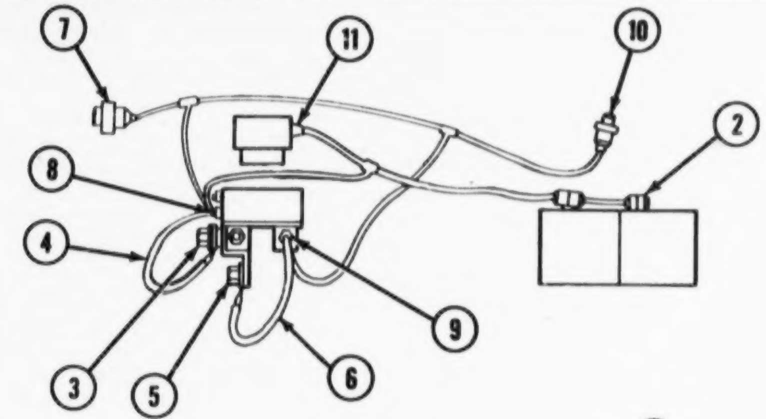
TA311099

ENGINE DISCONNECT BRACKET TO BULKHEAD WIRING HARNESS (12268100): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

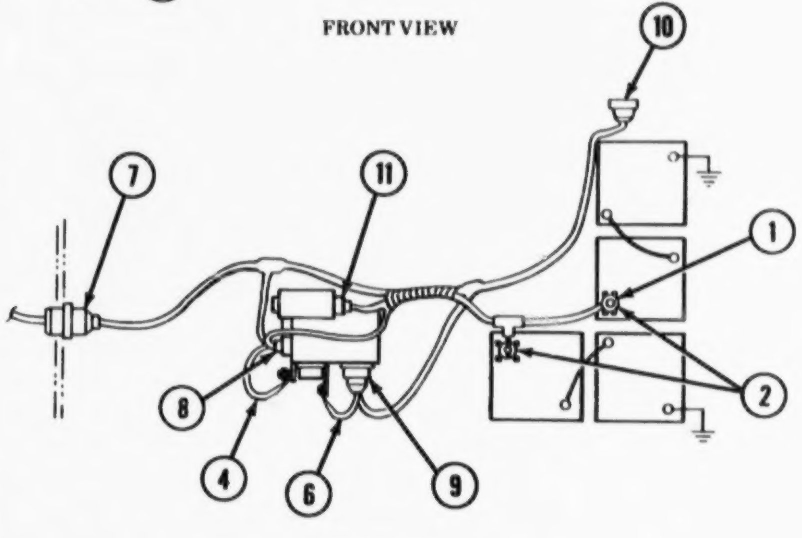

NUMBERS KEYED TO REMOVAL SEQUENCE
TO MASTER RELAY
11
TO BATTERY
2
TO DRIVER'S BULKHEAD
TO ENGINE DISCONNECT
GROUND
7
TO BILGE PUMP CIRCUIT BREAKER
10
6
4
8
9
TO VOLTAGE REGULATOR
TO STARTER RELAY
TO MASTER RELAY
TO BATTERY
10
11
81
81
81
2
TO ENGINE DISCONNECT
N 352B
G 352A
C 486A
D 36
K 33A
L 324
M 321
H 509
J 588-588L
E PLUG
A 486
B 415B
F PLUG
P
278
400-459B
14B
415
14
P
M
F
J
E
H
L
N
R
PLUG A
C
D
K
S
B
T
TO DRIVER'S BULKHEAD
7
278
2
3
14B
14B
14
E D F B A C
C B A
8
4
6
9
TO VOLTAGE REGULATOR
TO STARTER RELAY

TA311100

ENGINE DISCONNECT BRACKET TO BULKHEAD WIRING HARNESS (12268100): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



FRONT VIEW



TOP VIEW

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

When working on batteries, wear eye protection. Remove all jewelry, dog tags and metal items.

NOTE

Open battery access and transmission access doors.

A Remove two screws, two lockwashers, two nuts (1) and disconnect two connectors (2) from batteries.

NOTE

Reinstall hardware in appropriate connectors.

B Remove nut, lockwasher (3) and ground wire (4) from voltage regulator mount.

C Remove nut, lockwasher (5) and lead (6) from bilge pump circuit breaker.

TA311101

ENGINE DISCONNECT BRACKET TO BULKHEAD WIRING HARNESS (12268100): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

D Disconnect five connectors (7, 8, 9, 10 and 11).

E Remove engine-to-bulkhead wiring harness.

DISASSEMBLY

A Remove section of electrical tape from harness.

NOTE

Remove electrical tape only from section of harness to be disassembled.

B Separate and isolate harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

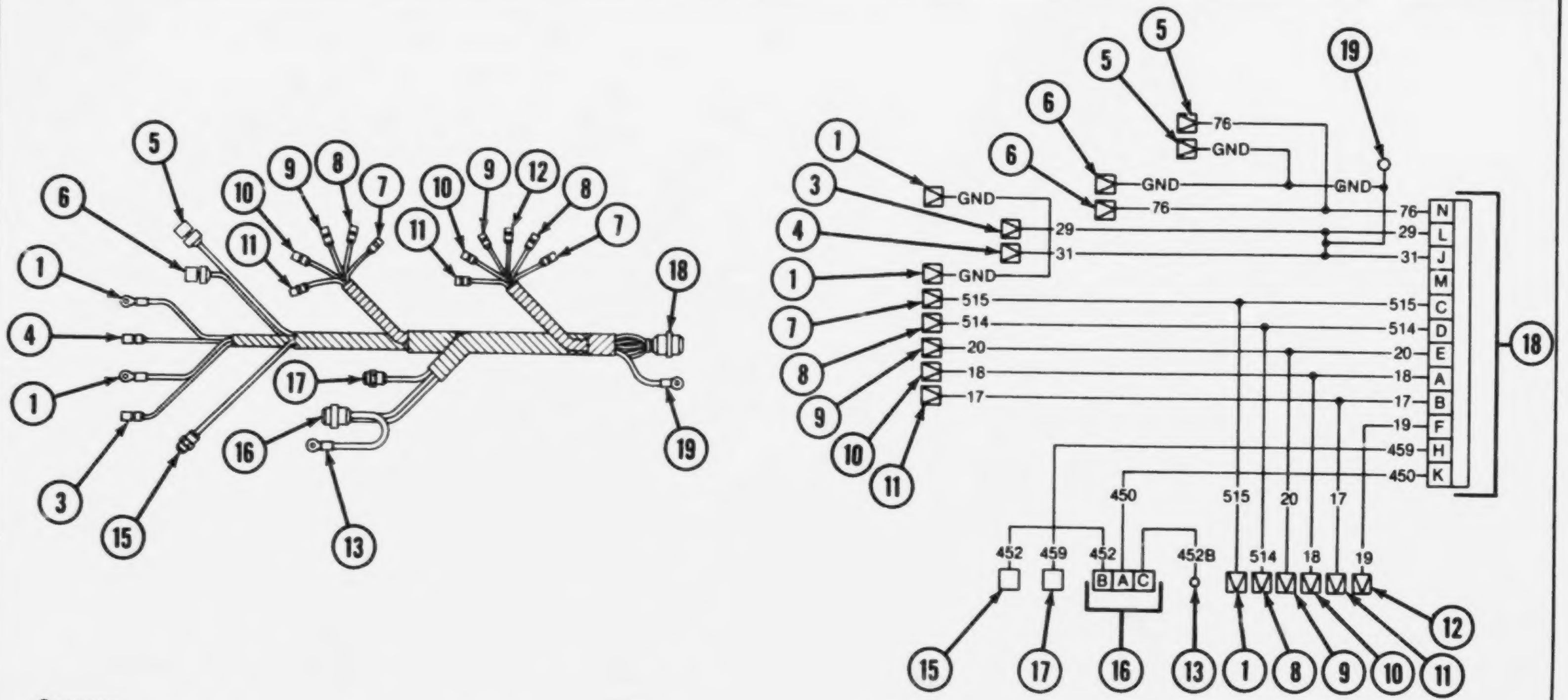
Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

TA311102

BULKHEAD TO HEADLIGHTS/BILGE PUMP WIRING HARNESS (10921380): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


5
6
1
4
1
3
15
10
9
8
7
11
10
9
12
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7
11
17
16
13
18
19
5
5
19
6
6
1
3
4
1
7
8
9
10
11
76
GND
GND
76
GND
GND
29
31
GND
515
514
20
18
17
76
29
31
515
514
20
18
17
19
459
450
N
L
J
M
C
D
E
A
B
F
H
K
18
450
515
20
17
452
459
452
452B
514
18
19
B A C
15
17
16
13
1
8
9
10
11
12

Connector Number	Electrical Lead To:	Wire No.
1	Right upper and lower fuel tank	Ground
3	Right upper fuel tank transmitter lead	29
4	Right lower fuel tank transmitter lead	31
5	Left fuel pump lead	76, GND
6	Right fuel pump lead	76, GND
7	Service blackout IR lower beam	515
8	Service blackout IR upper beam	514
9	Blackout marker (front light assembly)	20
10	Service headlight low beam	18
11	Service headlight high beam	17
12	BO-IR drive light lead	19

Connector Number	Electrical Lead To:	Wire No.
13	Bilge pump circuit breaker connector	452B
15	Bilge pump motor connector	452
16	Bilge pump relay connector	452, 450, 452B
17	Master relay connector	459
18	Bulkhead connector	
19	Ground	
	Bilge pump relay lead	452
	Bilge pump relay energizing circuit	450
	Bilge pump relay power lead	452B

TA312808

BULKHEAD TO HEADLIGHTS/BILGE PUMP WIRING HARNESS (10921380): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

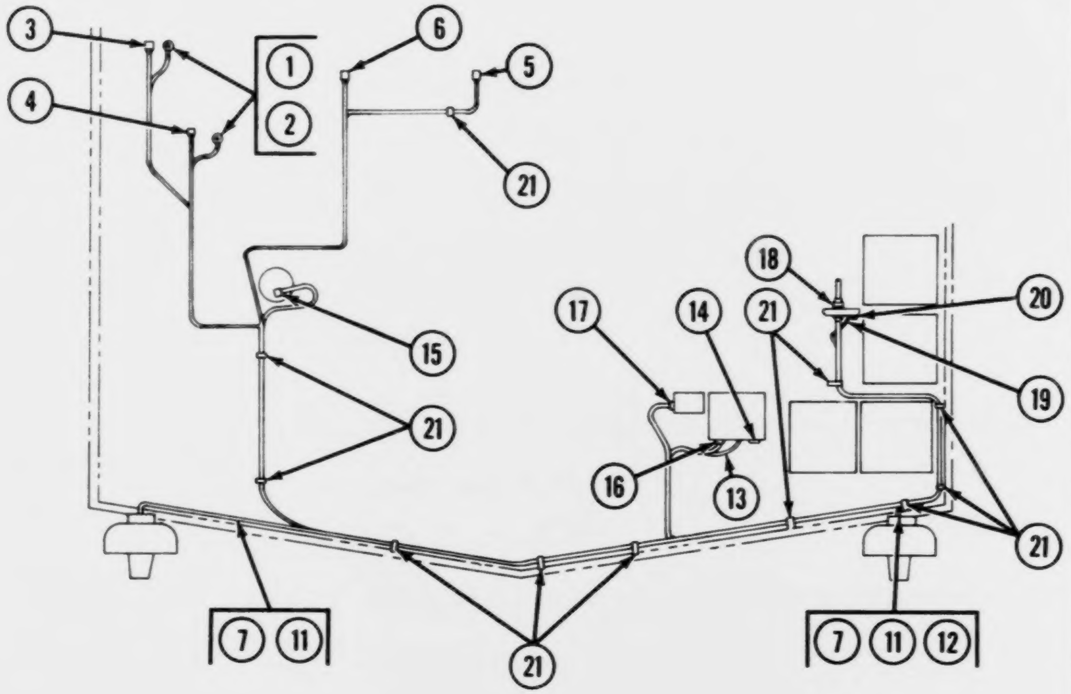
INITIAL SETUP

Materials/Parts:

Tape, electrical (item 60, Appx D)

Equipment Condition:

Powerpack removed (p 3-1).



LEGEND

1	Ground wire (2) - fuel level transmitter
2	Screw and two washers (2)
3-4	Connectors - fuel level transmitter
5	Connector - left fuel pump
6	Connector - right fuel pump
7-11	Connector (10) - headlight assembly
12	Connector - BO marker light
13	Connector - bilge pump circuit breaker
14	Nut and two washers
15	Connector - bilge pump motor
16	Connector - bilge pump relay
17	Connector - master relay
18	Connector - bulkhead
19	Ground wire
20	Screw and two washers
21	Attaching strap, screw, lockwasher and flat washer (as required)

TA57167

BULKHEAD TO HEADLIGHTS/BILGE PUMP WIRING HARNESS (10921380): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

- Remove and disassemble wiring harness only to extent needed to repair defect.
- For wire identification, see p 6-72.

A Remove gound leads (1) from upper and lower fuel tanks by removing screw and two washers (2) from each lead.

B Disconnect two connectors (3 and 4) from fuel level transmitters.

C Remove two snap-in connectors (5 and 6) from fuel pumps.

D Disconnect 11 quick-disconnects (7 through 12) from both right and left headlight assemblies.

E Release connector wire (13) from bilge pump circuit breaker by removing nut and two washers (14).

F Disconnect four electrical connectors (15, 16, 17 and 18).

G Release ground lead (19) by removing screw and two washers (20).

H Remove plastic retainers, screws, lockwashers, and flat washers (21) to release wiring harness from vehicle. Discard lockwashers.

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

A Reassemble wiring branch.

B Regroup wiring branches and secure with electrical tape (item 60, Appx D).

INSTALLATION

A Install wiring harness in vehicle using plastic retainers, screws, new lockwashers, and flat washers (21).

B Install ground lead (19) with screw and two washers (20).

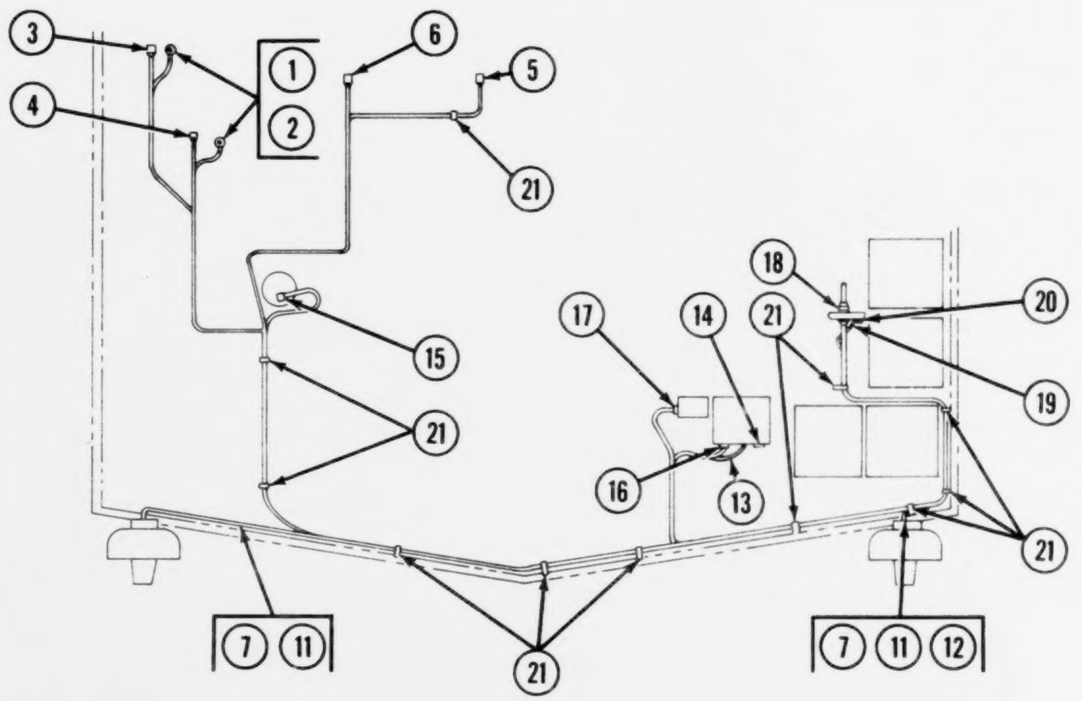
C Connect four electrical connectors (15, 16, 17 and 18).

D Install connector wire (13) to bilge pump circuit breaker with nut and two washers (14).

E Connect 11 quick-disconnects (7 through 12) to both right and left headlight assemblies.

TA57168

BULKHEAD TO HEADLIGHTS/BILGE PUMP WIRING HARNESS (10921380): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



LEGEND

1	Ground wire (2) - fuel level transmitter
2	Screw and two washers (2)
3-4	Connectors - fuel level transmitter
5	Connector - left fuel pump
6	Connector - right fuel pump
7-11	Connector (10) - headlight assembly
12	Connector - BO marker light
13	Connector - bilge pump circuit breaker
14	Nut and two washers
15	Connector - bilge pump motor
16	Connector - bilge pump relay
17	Connector - master relay
18	Connector - bulkhead
19	Ground wire
20	Screw and two washers
21	Attaching strap, screw, lockwasher and flat washer (as required)

F Install two snap-in connectors (5 and 6) to fuel pumps.

G Connect two connectors (3 and 4) to fuel level transmitters.

H Install ground leads (1) to upper and lower fuel tanks with screw and two washers (2) for each lead.

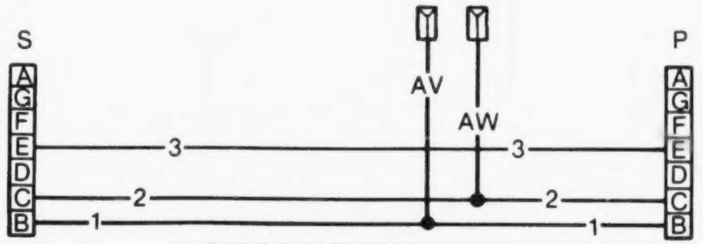
TA57169

RECTIFIER TO REGULATOR WIRING HARNESS (12330342): REMOVAL AND INSTALLATION

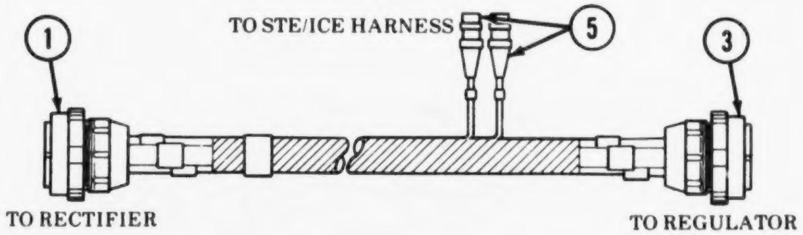
INITIAL SETUP

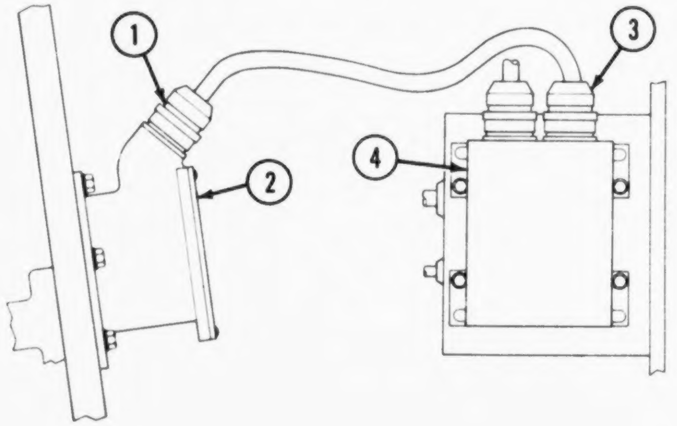
Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.


S
A
G
F
E
D
C
B
3
2
1
AV
AW
P

WIRING HARNESS BML61488


TO STE/ICE HARNESS
5
1
3
TO RECTIFIER
TO REGULATOR



REMOVAL

A Disconnect plug (1) from rectifier (2).

B Disconnect plug (3) from regulator (4).

C Disconnect connectors (5) from STE/ICE harness 12329994.

INSTALLATION

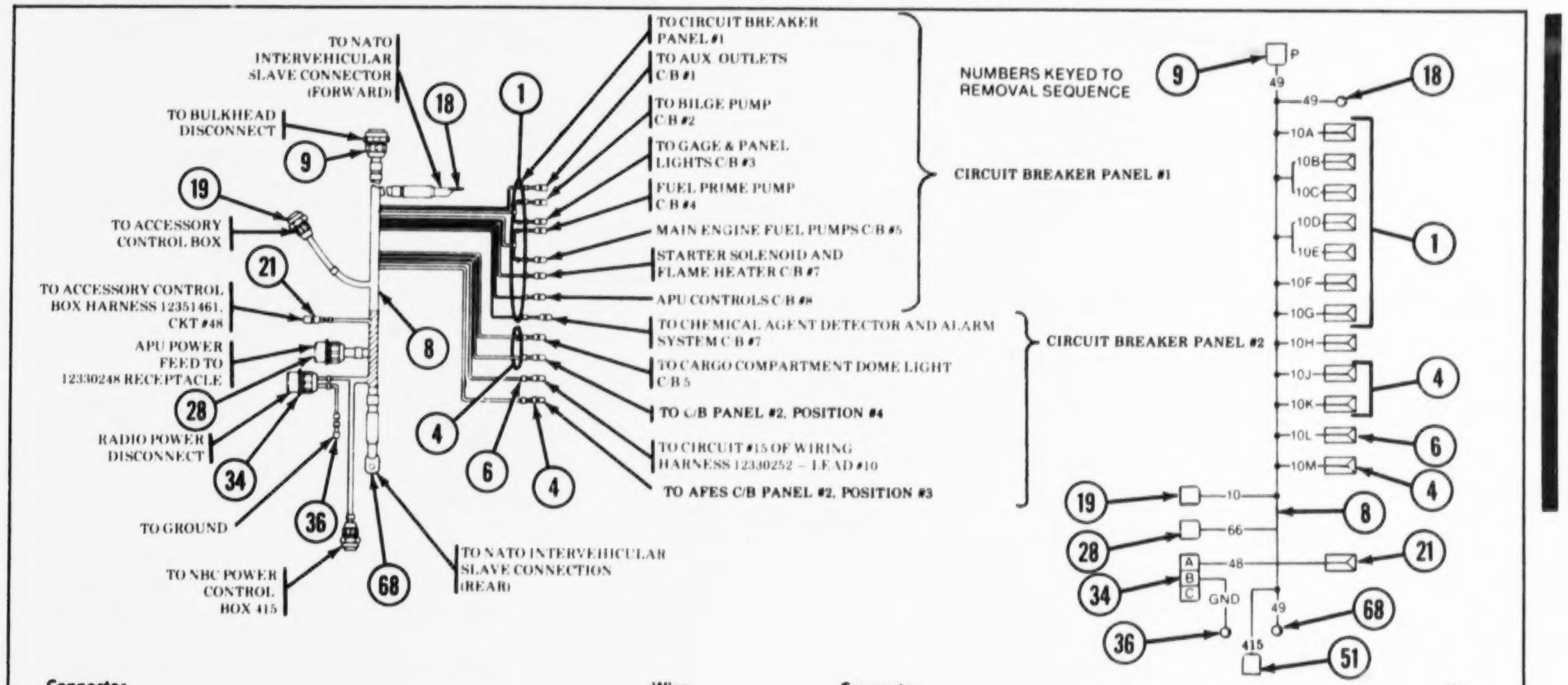
A Connect connector (5) to STE/ICE harness 12329994.

B Connect plug (3) to regulator (4).

C Connect plug (1) to rectifier (2).

TA57179

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


TO NATO INTERVEHICULAR SLAVE CONNECTOR (FORWARD)
TO BULKHEAD DISCONNECT
TO ACCESSORY CONTROL BOX
TO ACCESSORY CONTROL BOX HARNESS 12351461, CKT #48
APU POWER FEED TO 12330248 RECEPTACLE
RADIO POWER DISCONNECT
TO GROUND
TO NBC POWER CONTROL BOX 415
TO NATO INTERVEHICULAR SLAVE CONNECTION (REAR)
TO CIRCUIT BREAKER PANEL #1
TO AUX OUTLETS C/B #1
TO BILGE PUMP C/B #2
TO GAGE & PANEL LIGHTS C/B #3
FUEL PRIME PUMP C/B #4
MAIN ENGINE FUEL PUMPS C/B #5
STARTER SOLENOID AND FLAME HEATER C/B #7
APU CONTROLS C/B #8
TO CHEMICAL AGENT DETECTOR AND ALARM SYSTEM C/B #7
TO CARGO COMPARTMENT DOME LIGHT C/B 5
TO C/B PANEL #2, POSITION #4
TO CIRCUIT #15 OF WIRING HARNESS 12330252 – LEAD #10
TO AFES C/B PANEL #2, POSITION #3
CIRCUIT BREAKER PANEL #1
CIRCUIT BREAKER PANEL #2
NUMBERS KEYED TO REMOVAL SEQUENCE
9
18
1
19
21
8
28
34
36
68
4
6
4
51
P
49
49
10A
10B
10C
10D
10E
10F
10G
10H
10J
10K
10L
10M
10
66
48
A
B
C
GND
49
415

Connector Number	Electrical Lead To:	Wire No.
1	Circuit breaker panel 1, circuit breakers auxiliary outlets C/B, bilge pump C/B, gage and panel lights C/B, fuel prime pump C/B, main engine fuel pumps C/B, starter solenoid and flame heater C/B, APU controls C/B	(7) 10
4	Panel 2, circuit breakers 7, 5, 4 and 3	(4) 10
6	Circuit 15 of wiring harness 12330252	10
8	Power harness	
9	Bulkhead disconnect	49

Connector Number	Electrical Lead To:	Wire No.
18	NATO slave receptacle	49
19	Accessory control box	10
21	Harness 12351461	48
28	APU power feed to 12330248 receptacle	66
34	Radio power disconnect	48
36	Radio power disconnect	GND
51	NBC power control box	415
68	NATO slave receptacle	49

TA57183

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

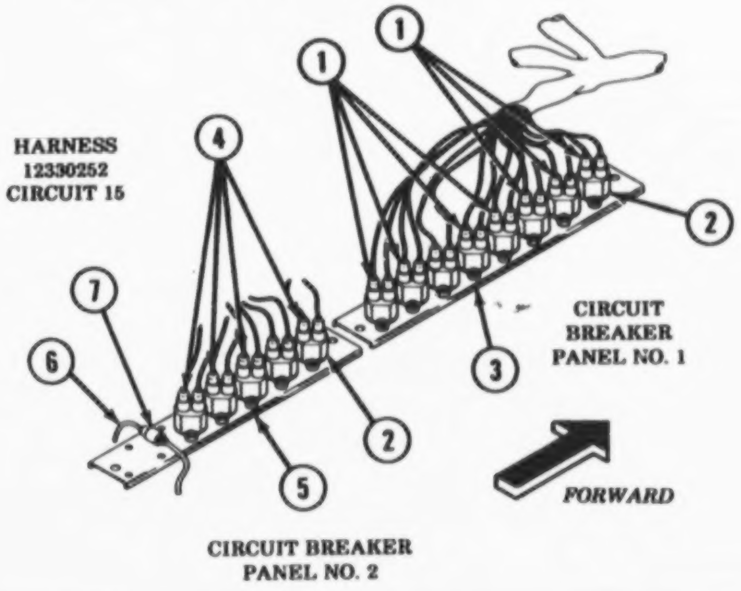
INITIAL SETUP

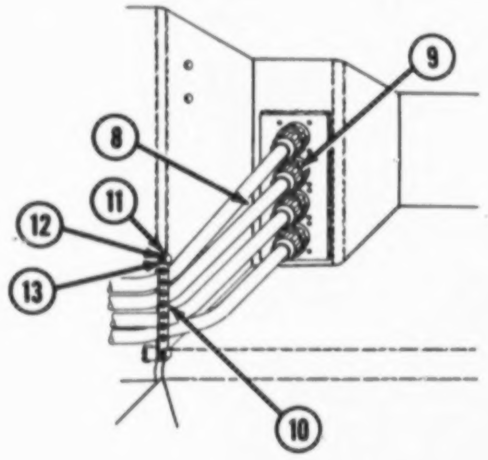
Materials/Parts:

Tape, electrical (item 60, Appx D)

Equipment Condition:

Battery ground cables disconnected (p 6-44).
MASTER switch OFF.
Driver's instrument panel removed (p 6-19).
APU control box removed (p 3-35).
NBC M2A 2 air purifier removed (p 14-3).
M-45 periscope box removed (p 10-11).


HARNESS
12330252
CIRCUIT 15
①
①
④
⑦
⑥
②
③
②
⑤
CIRCUIT
BREAKER
PANEL NO. 1
FORWARD
CIRCUIT BREAKER
PANEL NO. 2



REMOVAL

A Disconnect seven leads (1) from circuit breakers (2), panel 1 (3).

B Disconnect four leads (4) from circuit breakers (2), panel 2 (5).

C Disconnect lead (6) from harness (7).

D Disconnect harness (8) plug (9) from driver's bulkhead disconnect receptacle.

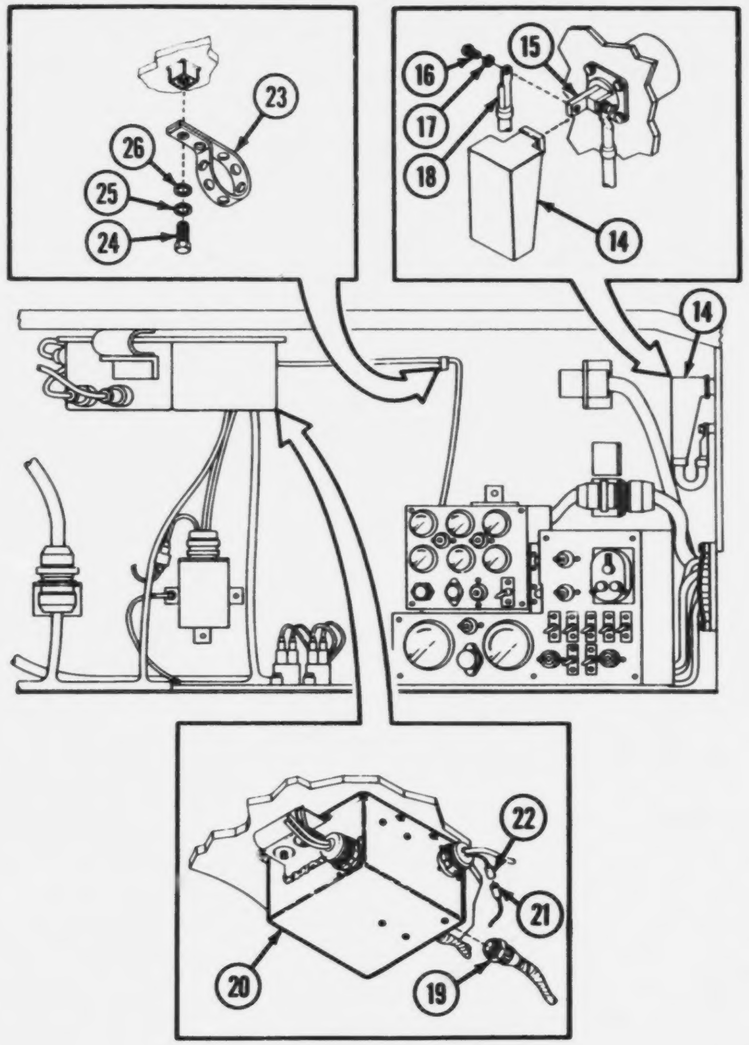
NOTE

Replace screws, lockwashers and flat washers. Do not remove other wiring harnesses from strap.

E Remove wiring harness (8) from two straps (10) by removing two screws (11), two lockwashers (12) and two flat washers (13) at only one end of each strap. Discard lockwashers . ■

TA57170

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



F Pull back boot (14) to expose forward NATO slave receptacle lug (15).

G Remove screw (16), lockwasher (17) and disconnect lead 49 (18) from lug (15). Discard lockwasher.

H Disconnect harness plugs (19) from accessory control box (20).

I Disconnect harness connector CKT 48 (21) from harness 12351461 cable connector no. 4B (22).

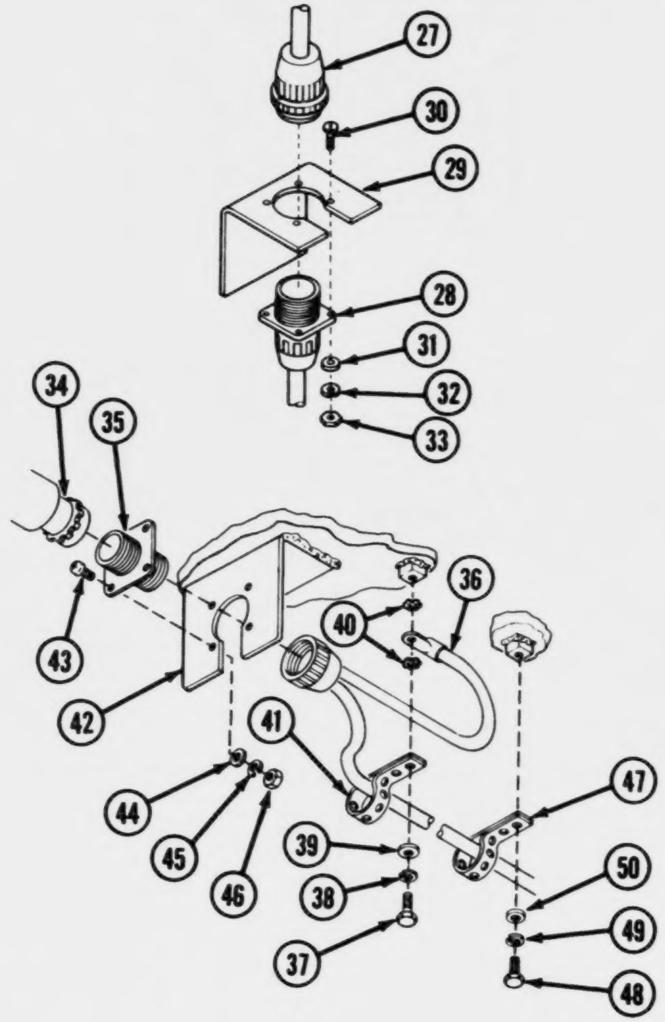
NOTE

Do not remove other harnesses from straps. Reinstall screws, lockwashers and flat washers.

J Remove harness from two harness straps (23) by removing screw (24), lockwasher (25) and flat washer (26) from each strap. Discard lockwashers.

TA57171

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



K Disconnect APU power lead 66 (27) from power feed receptacle (28).

L Remove receptacle (28) from wall-mounted bracket (29) by removing four screws (30), four flat washers (31), four lockwashers (32) and four nuts (33). Discard lockwashers.

NOTE

Radio power disconnect is located on left side of cargo compartment ceiling.

M Remove radio power disconnect (34) from radio power disconnect receptacle (35).

NOTE

Do not remove other harnesses. Reinstall two lockwashers, retaining strap, flat washer, lockwasher and screw.

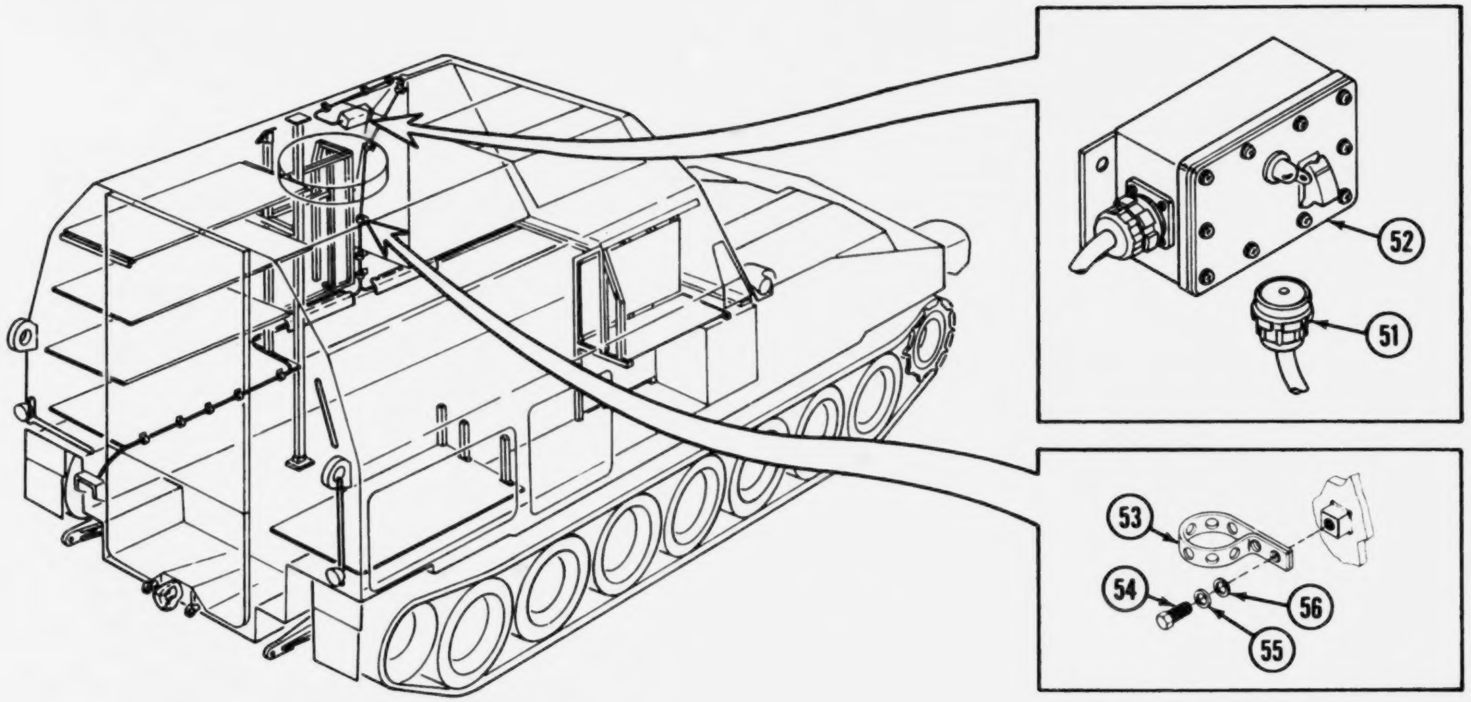
N Remove radio power disconnect ground lug (36) by removing screw (37), lockwasher (38), flat washer (39), two lockwashers (40) and harness retaining strap (41). Discard lockwashers.

O Remove radio power disconnect receptacle (35) from bracket (42) by removing four screws (43), four flat washers (44), four lockwashers (45) and four nuts (46). Discard lockwashers.

P Remove strap (47) by removing screw (48), lockwasher (49) and flat washer (50). Discard lockwasher.

TA57184

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



Q Disconnect NBC power control box plugs (51) from NBC control box (52).

R Remove seven retaining straps (53) by removing seven screws (54), seven lockwashers (55) and seven flat washers (56). Discard lockwashers.

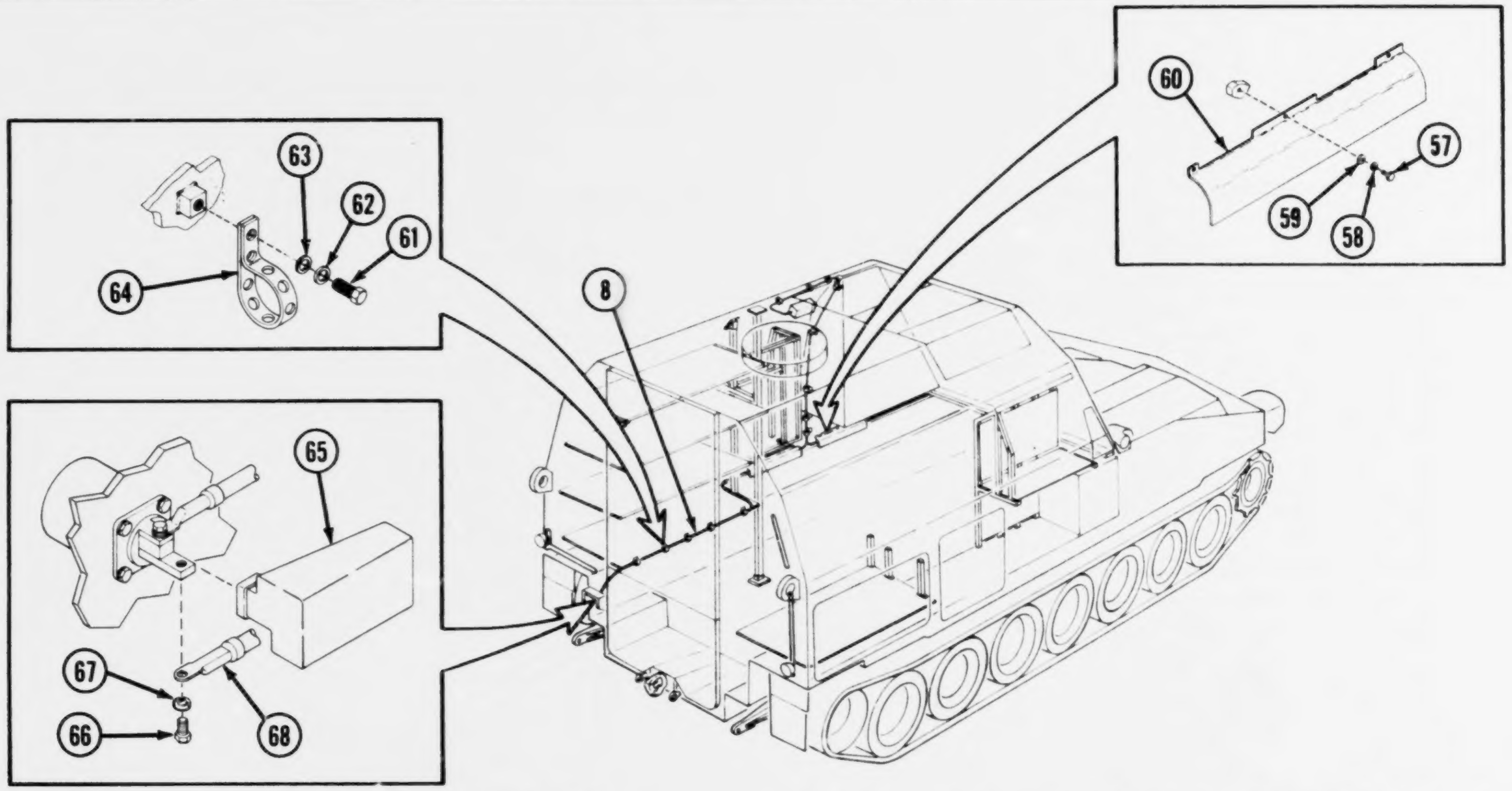
NOTE

Do not remove other harnesses from retaining straps.

S Remove radio disconnect receptacle lead and NBC power control box plug lead.

TA57172

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



T Remove seven screws (57), seven lockwashers (58) and seven flat washers (59) and remove two guards (60). Discard lockwashers.

NOTE

Do not remove other harnesses from retaining straps. Replace attaching hardware.

U Remove five screws (61), five lockwashers (62), five flat washers (63) and five straps (64). Discard lockwashers.

V Pull back boot (65). Remove screw (66), lockwashers (67) and harness lead (68). Discard lockwashers.

W Remove harness (8) from vehicle.

TA57173

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

A Reassemble wiring branch.

B Regroup wiring branches and secure with electrical tape (item 60, Appx D).

INSTALLATION

A Install harness (8) to vehicle by installing lead (68), new lockwashers (67), and screw (66). Push boot (65) back into position.

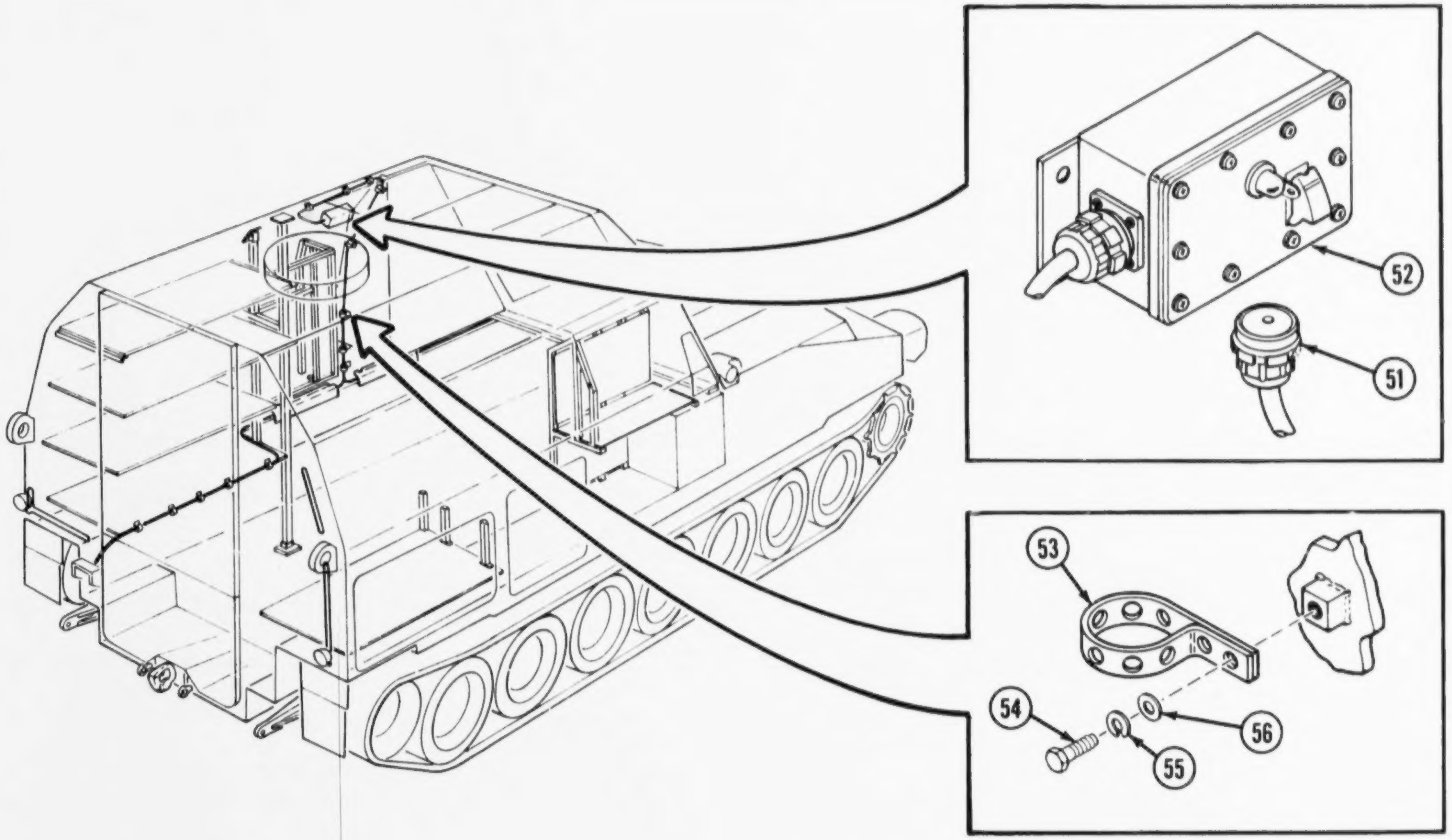
B Install five straps (64), five flat washers (63), five new lockwashers (62), and five screws (61).

C Install two guards (60) with seven flat washers (59), seven new lockwashers (58), and seven screws (57).

D Install NBC power control box plug lead and radio disconnect receptacle lead.

TA57174

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

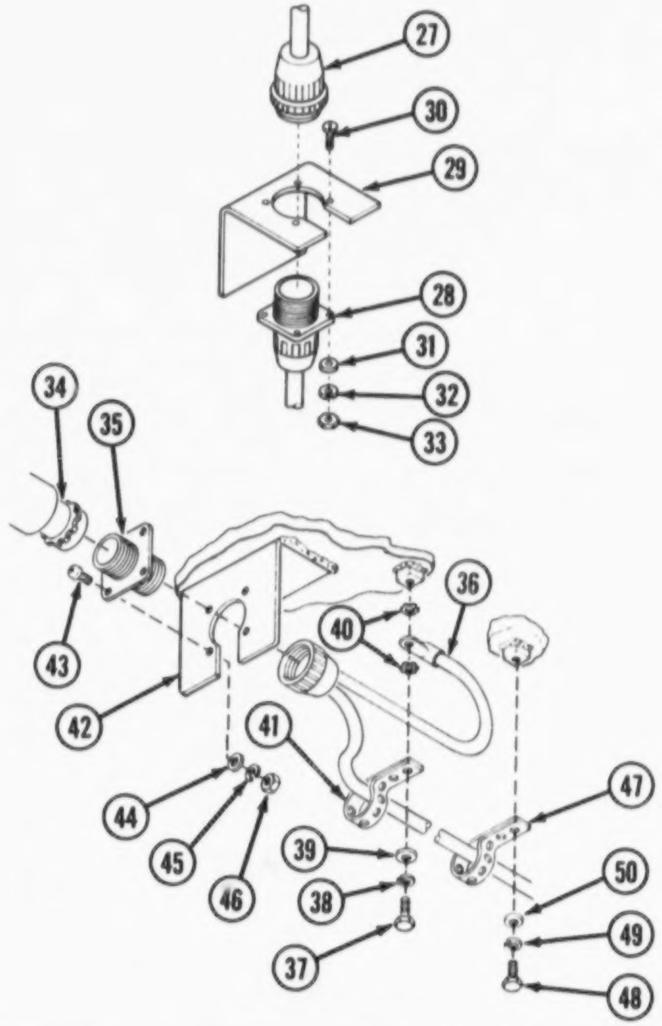


E Install seven retaining straps (53), with seven flat washers (56), seven new lockwashers (55), and seven screws (54).

F Connect NBC power control box plug (51) to NBC control box (52).

TA57175

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



G Install strap (47), with flat washer (50), new lockwasher (49) and screw (48).

H Install radio power disconnect receptacle (35) to bracket (42) by installing four screws (43), four flat washers (44), four new lockwashers (45) and four nuts (46).

I Install radio power disconnect ground lug (36) by installing harness retaining strap (41), two new lockwashers (40), flat washer (39), new lockwasher (38), and screw (37).

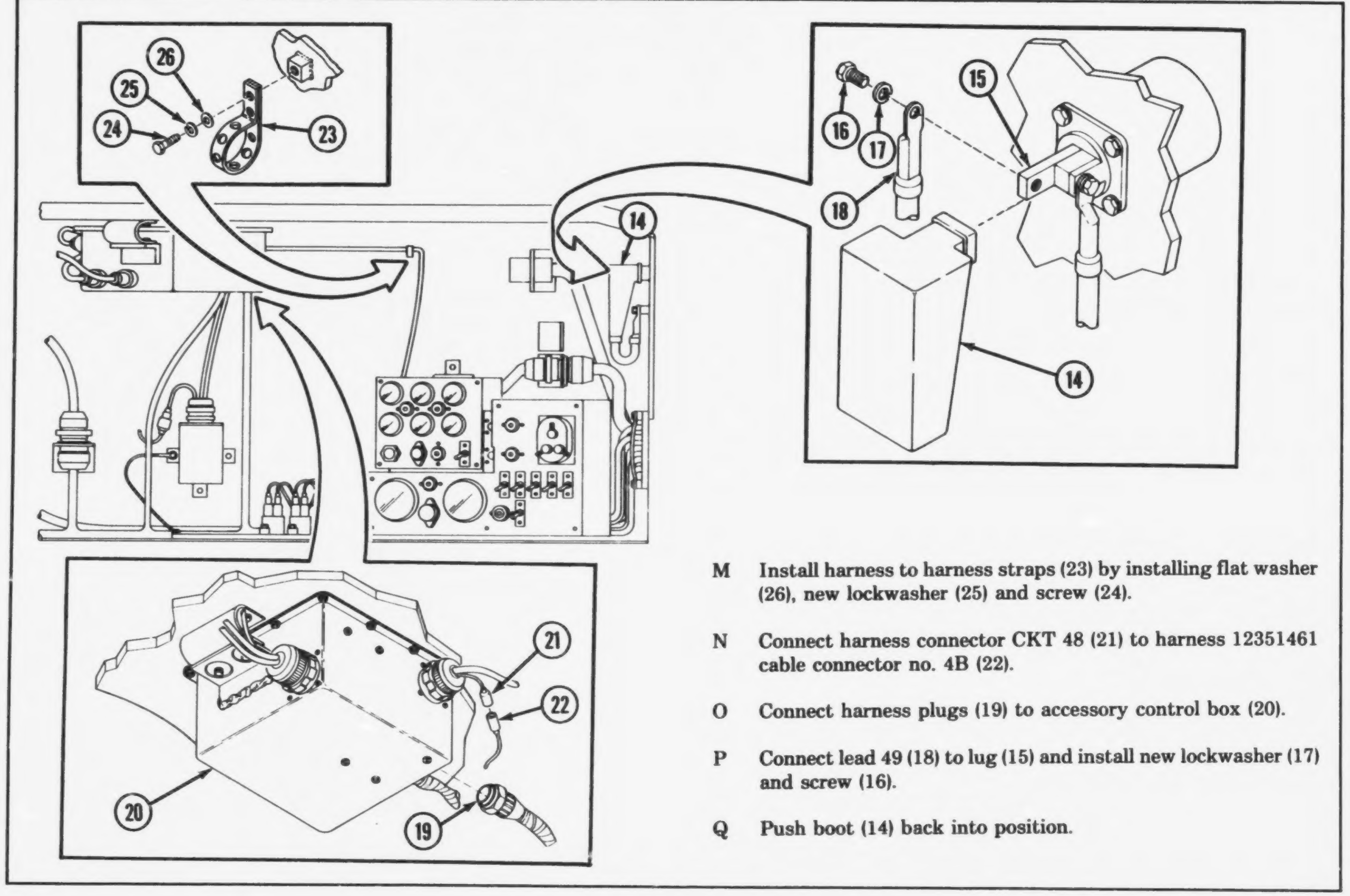
J Install radio power disconnect (34) to radio power disconnect receptacle (35).

K Install receptacle (28) to wall mounted bracket (29) by installing four screws (30), four flat washers (31), four new lockwashers (32) and four nuts (33).

L Connect APU power lead 66 (27) to power feed receptacle (28).

TA57176

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



M Install harness to harness straps (23) by installing flat washer (26), new lockwasher (25) and screw (24).

N Connect harness connector CKT 48 (21) to harness 12351461 cable connector no. 4B (22).

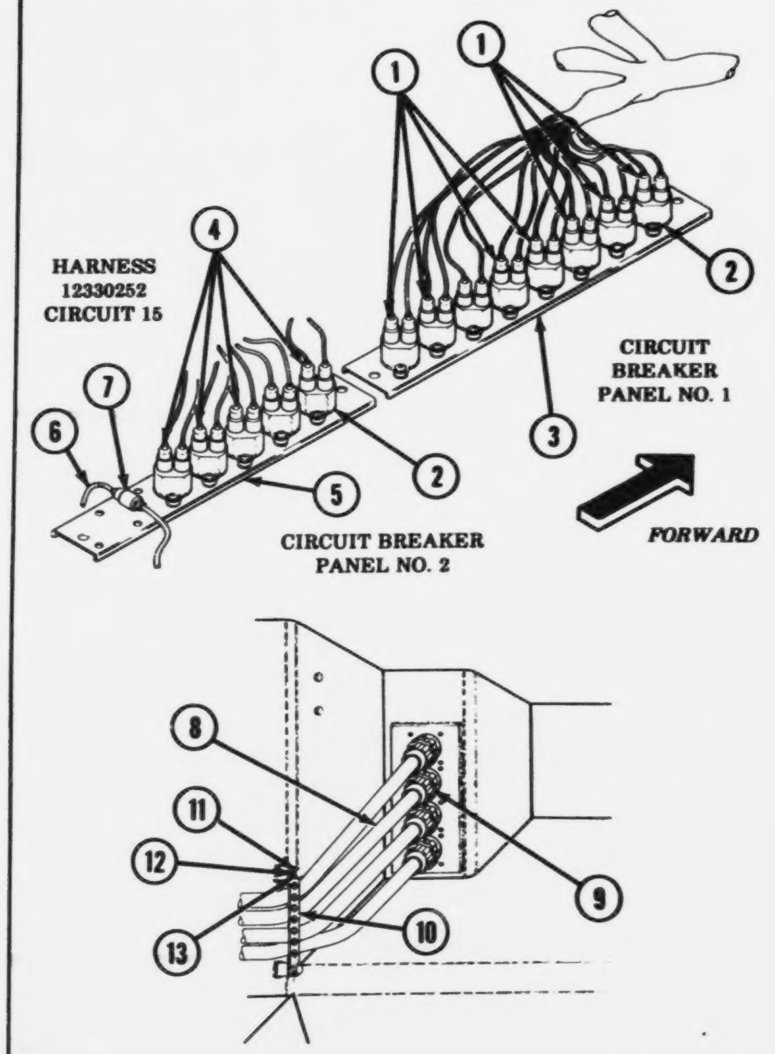
O Connect harness plugs (19) to accessory control box (20).

P Connect lead 49 (18) to lug (15) and install new lockwasher (17) and screw (16).

Q Push boot (14) back into position.

TA57177

POWER HARNESS (12330257): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



1
1
HARNESS 12330252 CIRCUIT 15
4
2
7
6
5
2
3
CIRCUIT BREAKER PANEL NO. 1
CIRCUIT BREAKER PANEL NO. 2
FORWARD
8
11
12
13
10
9

R Install wiring harness (8) to two straps (10), by installing two flat washers (13) two new lockwashers (12), and two screws (11).

S Connect harness (8) plug (9) to driver's bulkhead disconnect receptacle.

T Connect lead (6) to harness (7).

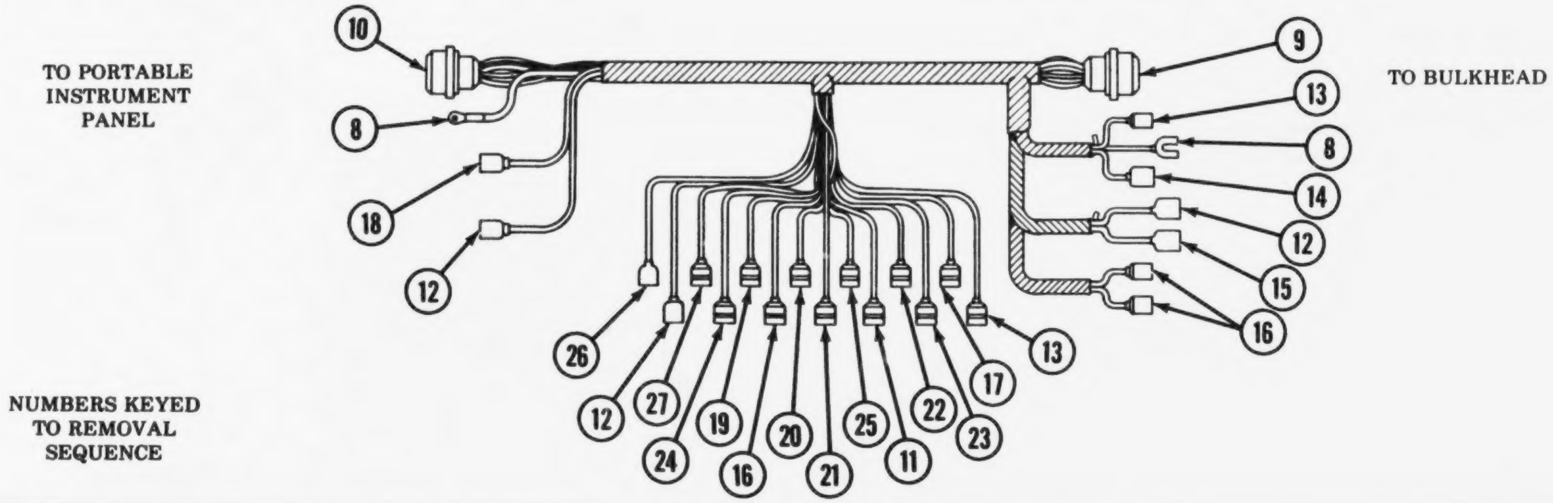
U Connect four leads (4) to circuit breakers (2), panel 2 (5) (refer to p 6-77).

V Connect seven leads (1) to circuit breakers (2), panel 1 (3) (refer to p 6-77).

TA57178

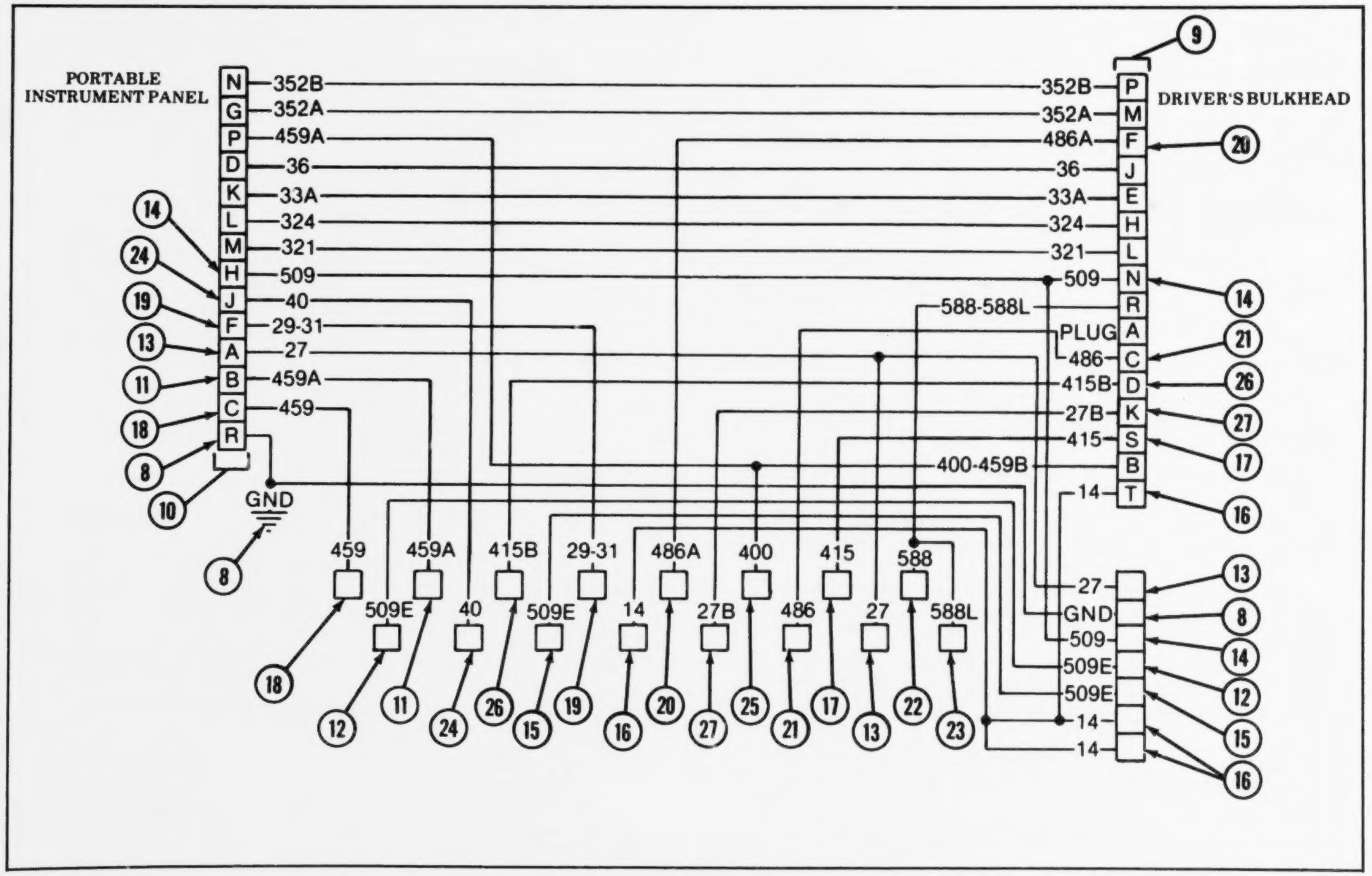
BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

Connector Number	Electrical Lead To:	Wire No.	Connector Number	Electrical Lead To:	Wire No.
8	Ground	GND	23	Fuel prime pump indicator lamp	588L
9	Bulkhead connector		24	Panel lights	40
10	Portable instrument connector		25	Accessory control box	400
11	Master switch	459A	26	Air cleaner blower motor relay	415B
12	Parking brake warning switch and light	509E	27	Connector to 415 air cleaner blower motor relay	27B
13	Engine instrument and master warning light	27			
14	Warning lamp - switch	509		Aeration detector	352B
15	Parking brake warning light	509E		Aeration detector	352A
16	Starter switch neutral safety switch	14		Master switch	459B
17	Air cleaner blower assembly	415		Engine oil pressure gage	36
18	Master switch	459		Engine water temperature gage	33A
19	Fuel level gage and switch	29-31		Transmission oil temperature gage	324
20	Flame heater switch	486A		Transmission oil pressure gage	321
21	Flame heater master switch	486		To fuel prime pump	588-588L
22	Fuel prime pump switch	588		To voltage regulator	400-459B


10
TO PORTABLE INSTRUMENT PANEL
8
18
12
9
TO BULKHEAD
13
8
14
12
15
16
26
12
27
24
19
16
20
21
25
11
22
23
17
13
NUMBERS KEYED TO REMOVAL SEQUENCE

TA57180

BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


PORTABLE INSTRUMENT PANEL
DRIVER'S BULKHEAD
N 352B — 352B P
G 352A — 352A M
P 459A — 486A F
D 36 — 36 J
K 33A — 33A E
L 324 — 324 H
M 321 — 321 L
H 509 — 509 N
J 40
F 29-31
A 27
B 459A
C 459
R
588-588L R
PLUG A
486 C
415B D
27B K
415 S
400-459B B
14 T
GND
459
459A
415B
29-31
486A
400
415
588
509E
40
509E
14
27B
486
27
588L
27
GND
509
509E
509E
14
14
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TA57181

BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

INITIAL SETUP

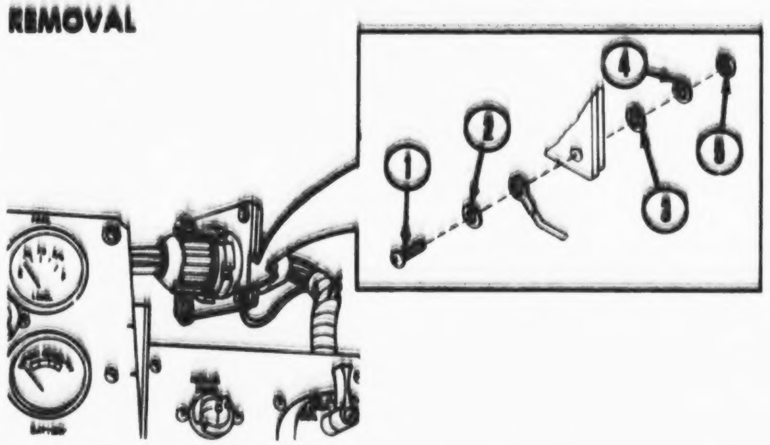
Materials/Parts:

Tape, electrical (item 60, Appx D)

Equipment Condition:

Battery ground cables disconnected (p 6-44).
MASTER switch OFF.
Portable instrument panel removed (p 6-19).

REMOVAL



A Remove four screws (1), lockwasher (2), four flat washers (3), four lockwashers (4), and four nuts (5). Discard lockwashers.

B Remove screw (6) and washer (7) and release ground wire (8) from plastic attaching strap.

C Disconnect two connectors (9 and 10).

D Disconnect wires 459A (11) and 509E (12) between circuit breakers and driver's instrument panel.

E Disconnect steering column-mounted master warning light harness. Disconnect three wires 27, 509 and GND (13, 14 and 8) at snap-in connectors.

F Disconnect two 509E wire snap-in connectors (12 and 15) from parking brake warning switch at brake assembly.

G Disconnect two wire 14 snap-in connectors (16) at transmission shift control linkage.

H Disconnect wire connector 27 (13) from circuit breaker.

I Disconnect wire 415 connector (17) from lead assembly 10897991 wire 415 connector.

J Disconnect wire connector 459 (18) from harness wire 459 connector 12330252.

K Disconnect seven connectors (19, 12, 16, 20, 21, 22 and 23) at driver's control panel.

L Disconnect two connectors, wire 40 (24) and wire 400 (25) from behind driver's instrument panel.

M Disconnect two connectors, wire 415B (26) and wire 27B (27) at air cleaner blower relay connector.

N Disconnect wire 415 connector (17) from lead assembly 10897991 wire 415 connector.

TA57182

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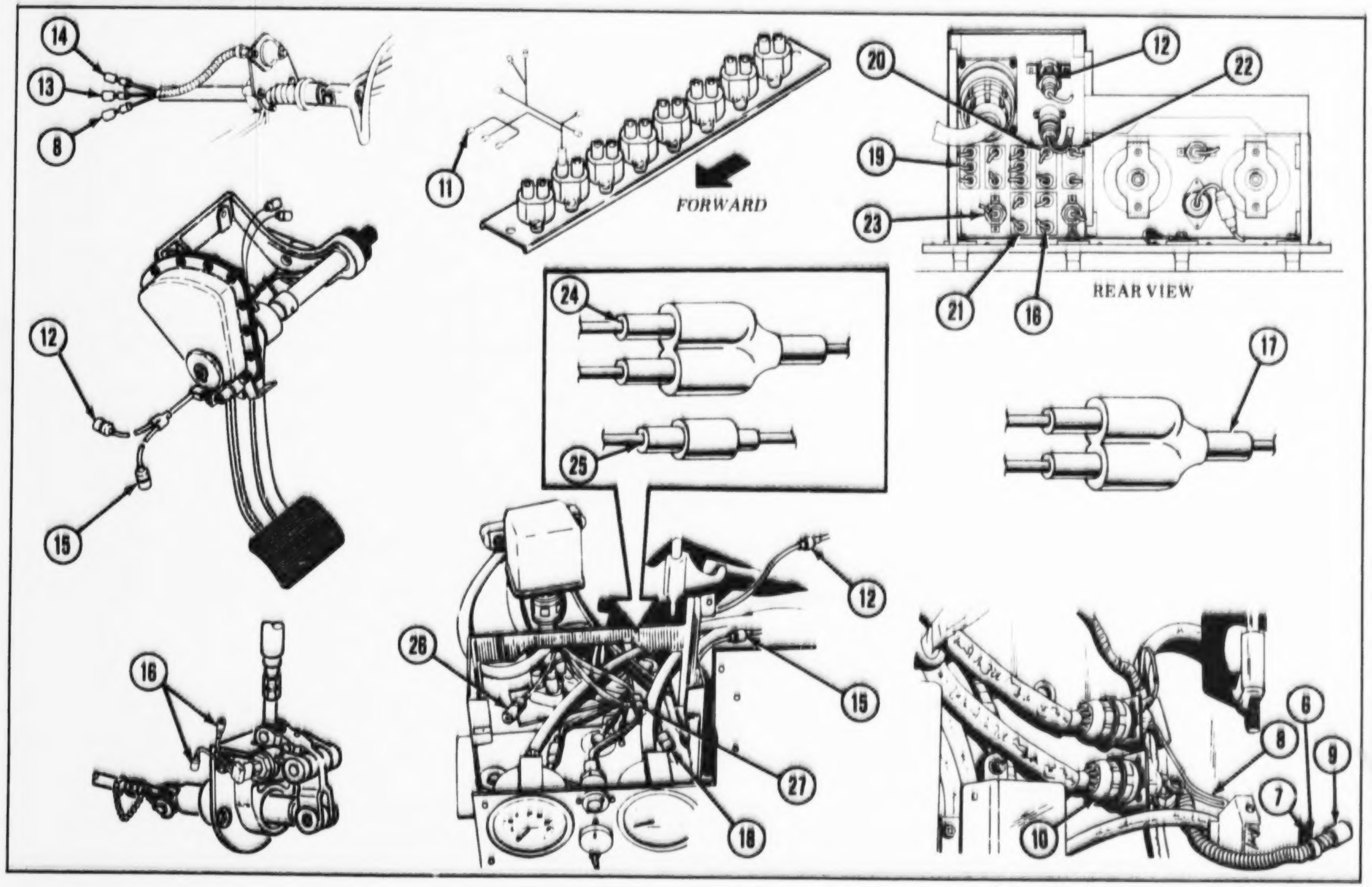
BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


14
13
8
11
FORWARD
20
12
22
19
23
21
16
REAR VIEW
12
15
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12
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TA57185

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BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

A Reassemble wiring branches (p 2-307).

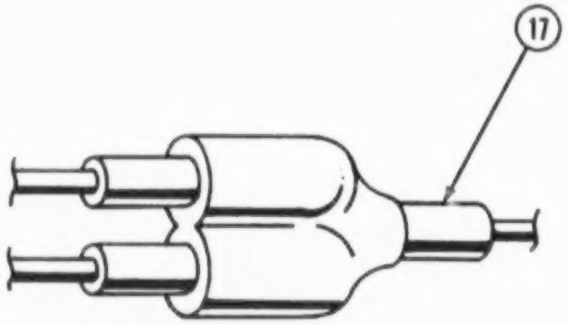
B Regroup wiring branches and secure with electrical tape (item 60, Appx D).

INSTALLATION

NOTE

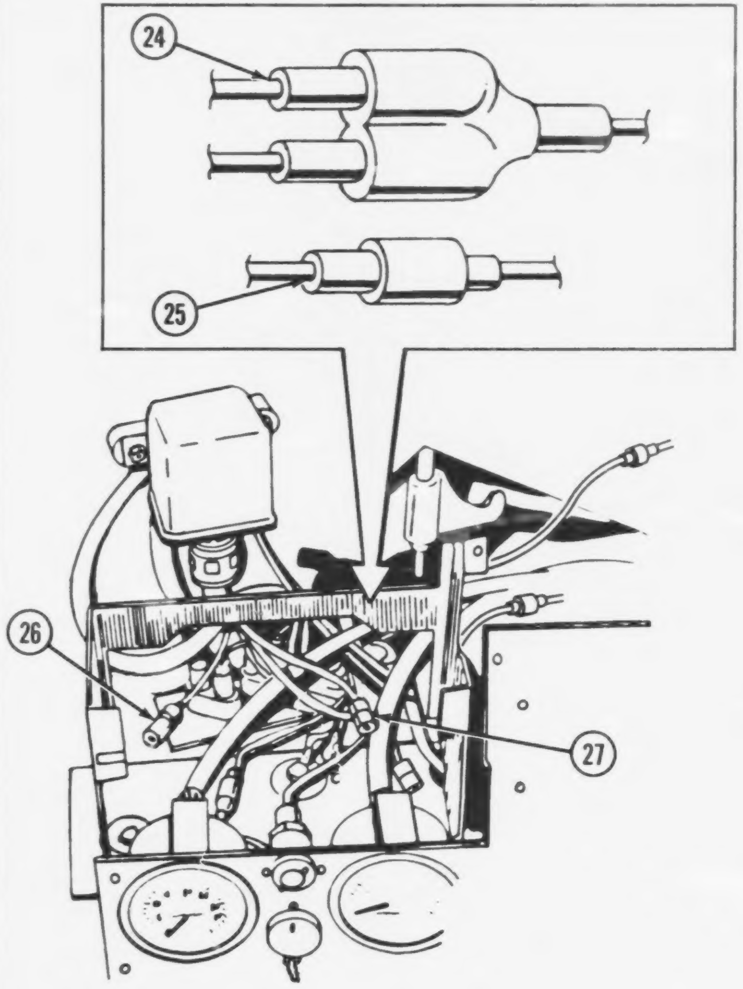
Guide to wire connector locations on instrument panel is located on pages 6-24 and 6-25.

A Connect wire 415 connector (17) to lead assembly 10897991 wire 415 connector.



TA57186

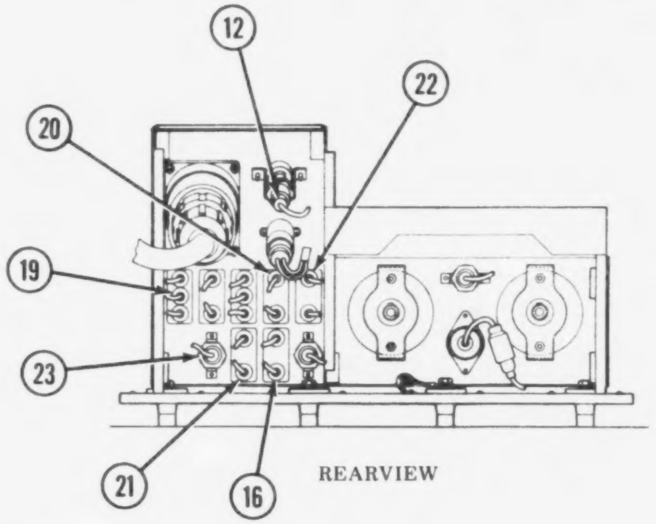
BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



B Connect two connectors, wire 415B (26) and wire 27B (27) at air cleaner blower relay connector.

C Connect two connectors, wire 40 (24) and wire 400 (25) from behind driver's instrument panel.

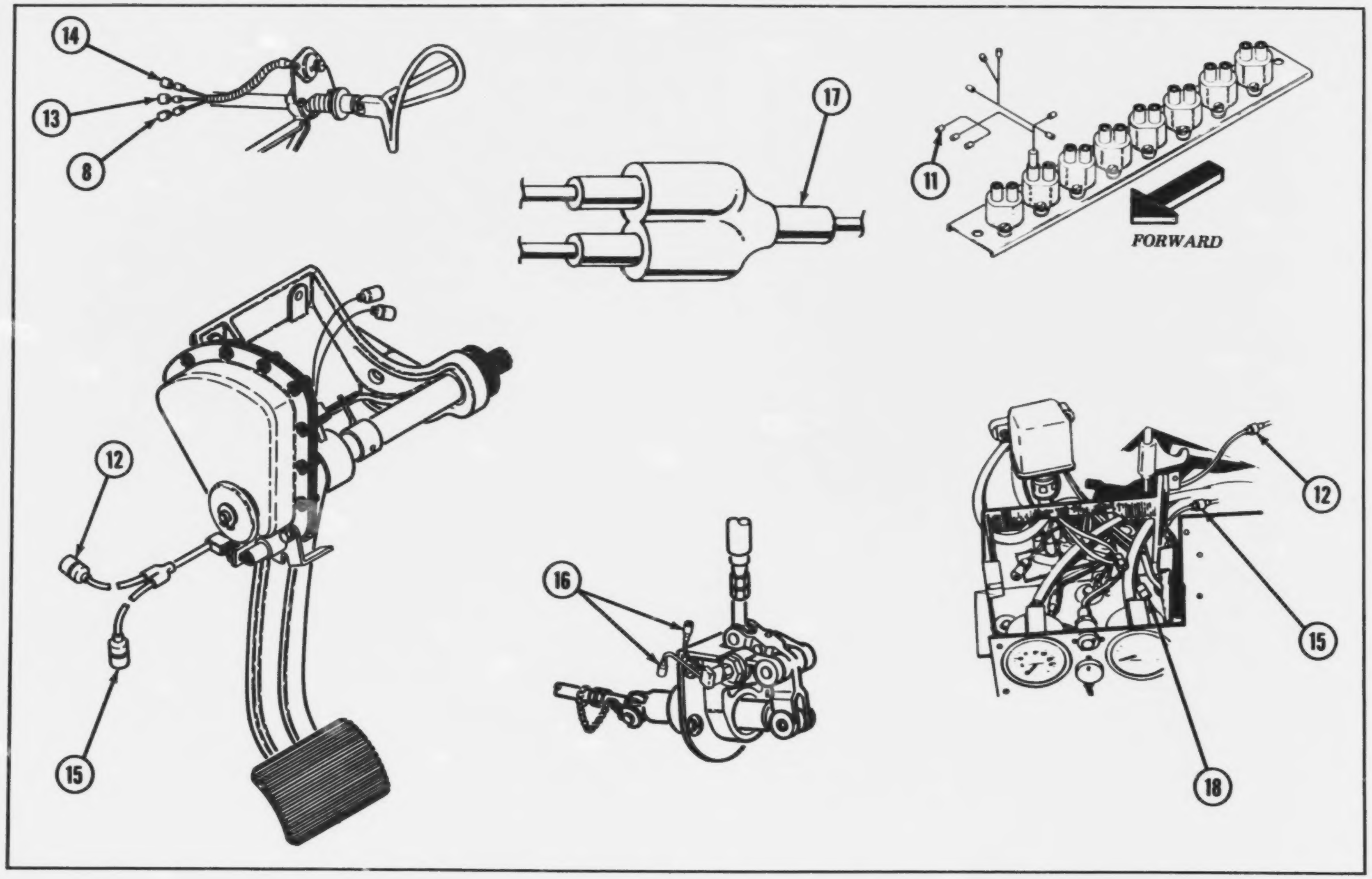
D Connect seven connectors (19, 12, 16, 20, 21, 22 and 23) to driver's control panel.



REARVIEW

TA57187

BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


14
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17
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FORWARD
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16
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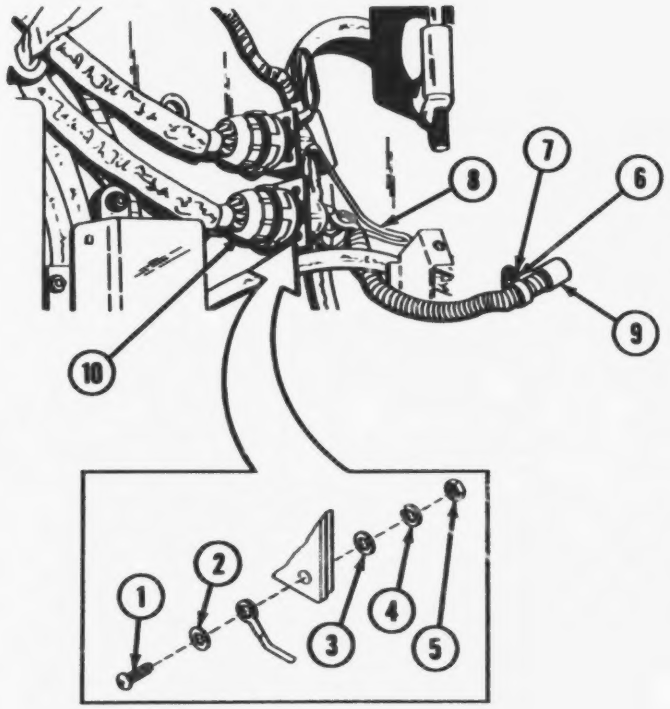
18

TA57188

BULKHEAD TO PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260287): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



E Connect wire connector 459 (18) to harness 12330252 wire 459 connector.

F Connect wire 415 connector (17) to lead assembly 10897991 wire 415 connector.

G Connect wire connector 27 (13) to circuit breaker.

H Connect two wire 14 snap-in connectors (16) to transmission shift control linkage.

I Connect two 509E wire snap-in connectors (12 and 15) at parking brake warning switch at brake assembly.

J Connect steering column-mounted master warning light harness. Connect three wires 27, 509 and GND (13, 14 and 8) at snap-in connectors.

K Connect wires 459A (11) and 509E (12) between circuit breakers and driver's instrument panel.

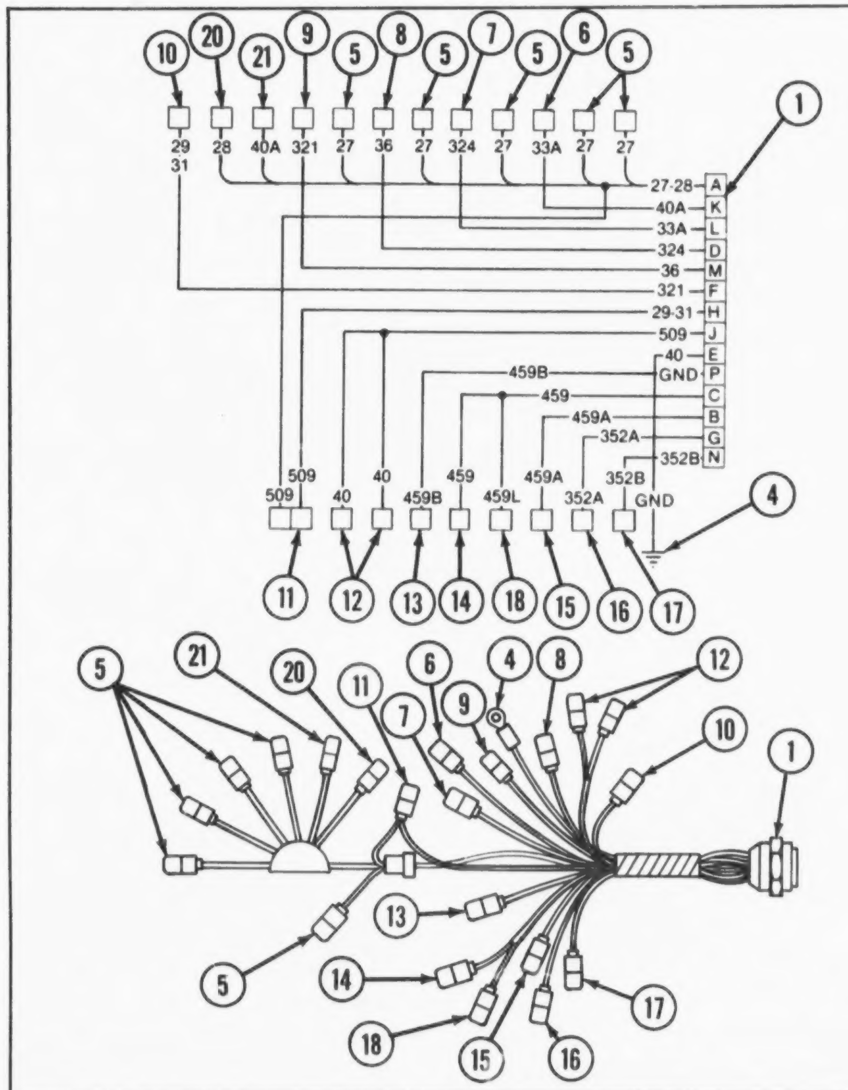
L Connect two connectors (9 and 10).

M Install ground wire (8), to plastic attaching strap by installing screw (6) and washer (7).

N Install four screws (1), new lockwasher (2), four flat washers (3), four new lockwashers (4) and four nuts (5).

TA57189

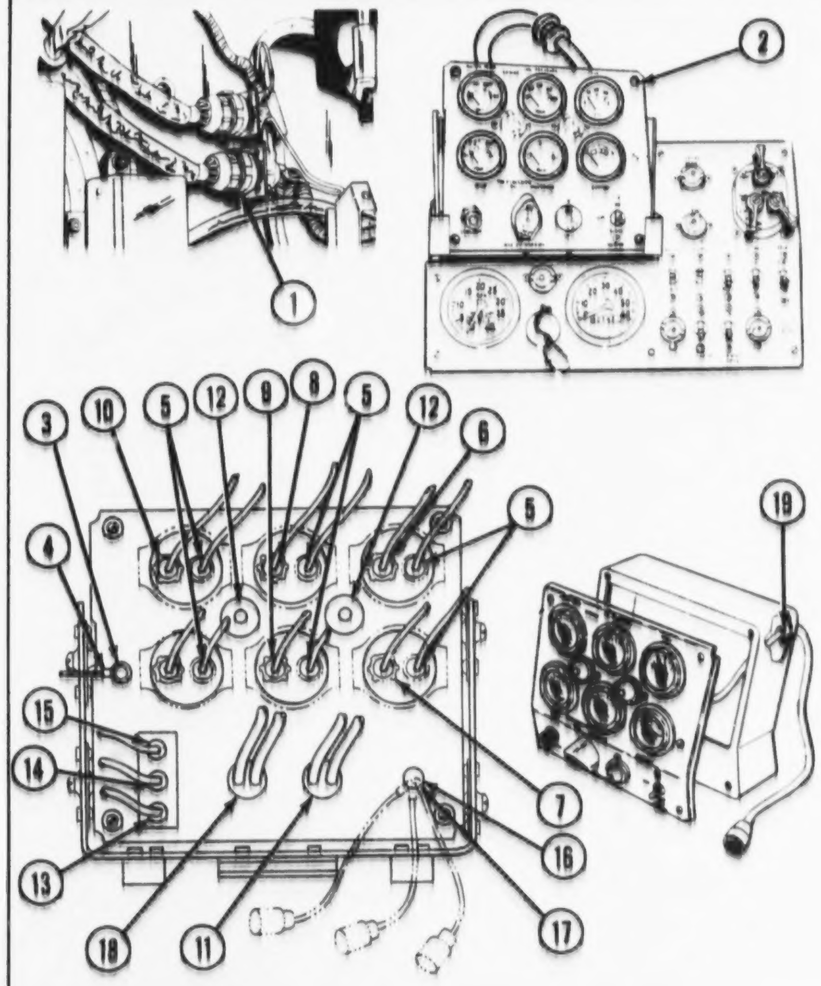
PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260298): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


10
20
21
9
5
8
5
7
5
6
5
1
29
31
28
40A
321
27
36
27
324
27
33A
27
27
27-28
A
40A
K
33A
L
324
D
36
M
321
F
29-31
H
509
J
40
E
GND
P
459B
459
C
459A
B
352A
G
352B
N
509
509
40
40
459B
459
459L
459A
352A
352B
GND
4
11
12
13
14
18
15
16
17
5
21
20
11
6
4
8
12
7
9
10
1
13
5
14
17
18
15
16

Connector Number	Electrical Lead To:	Wire No.
1	Connector harness 12260298	
4	Ground	GND
5	Power lead: engine instrumentation	27
6	Engine water temperature lead	33A
7	Transmission oil temperature lead	324
8	Engine oil pressure lead	36
9	Transmission oil pressure lead	321
10	Fuel gage lead	29-31
11	Warning lamp lead	509
12	Panel lights	40
13	Master switch output lead	459B
14	Master switch input	459
15	Master switch auxiliary outlet lead	459A
16	Coolant indicator	352A
17	Coolant indicator	352B
18	Master switch warning light	459L
20	Battery indicator	40A
21	Fuel gage	28

TA311120

PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260298): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect harness connector (1) at driver's bulkhead.

B Loosen four studs (2) and pull cover of panel outward to expose electrical leads to instruments.

C Remove screw and washers (3) to release ground lead (4).

NOTE

Reinstall screw and washer.

D Disconnect 21 electrical connectors (5 through 18).

E Remove wiring harness 12260298 and grommet (19) from panel assembly.

TA311121

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PORTABLE INSTRUMENT PANEL WIRING HARNESS (12260298): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate defective harness leads.

C Disassemble wiring branch and replace defective leads (p 2-307).

ASSEMBLY

Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

TA311122

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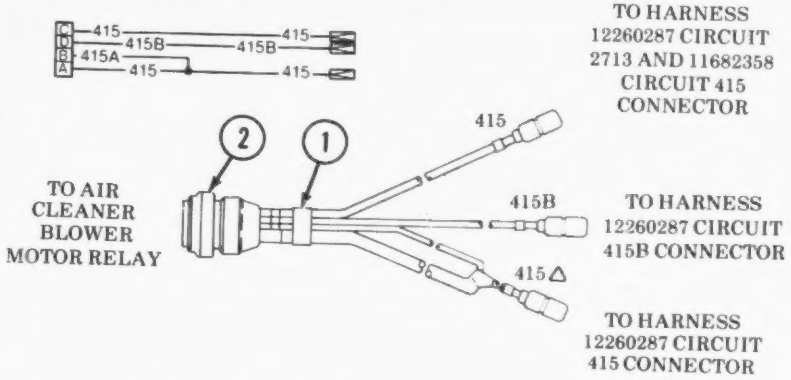
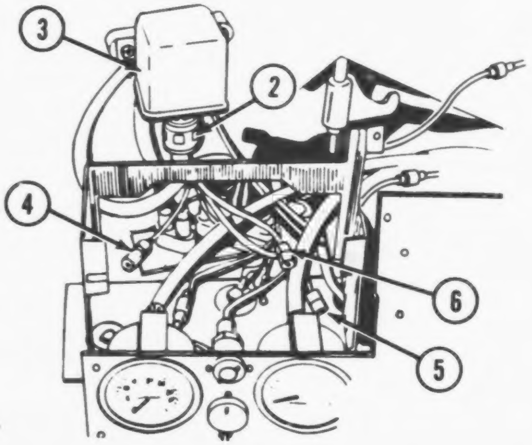
AIR CLEANER BLOWER MOTOR RELAY WIRING HARNESS (10897991): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


C
D
B
A
415
415B
415A
415
415
415B
415
TO HARNESS 12260287 CIRCUIT 2713 AND 11682358 CIRCUIT 415 CONNECTOR
415
2
1
TO AIR CLEANER BLOWER MOTOR RELAY
415B
TO HARNESS 12260287 CIRCUIT 415B CONNECTOR
415△
TO HARNESS 12260287 CIRCUIT 415 CONNECTOR



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove portable instrument panel (p 6-19).

B Disconnect harness (1) plug (2) from air cleaner blower motor relay (3).

C Disconnect three connectors (4, 5 and 6) from wiring harness circuit connectors.

D Remove harness (1) from vehicle.

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness branches.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

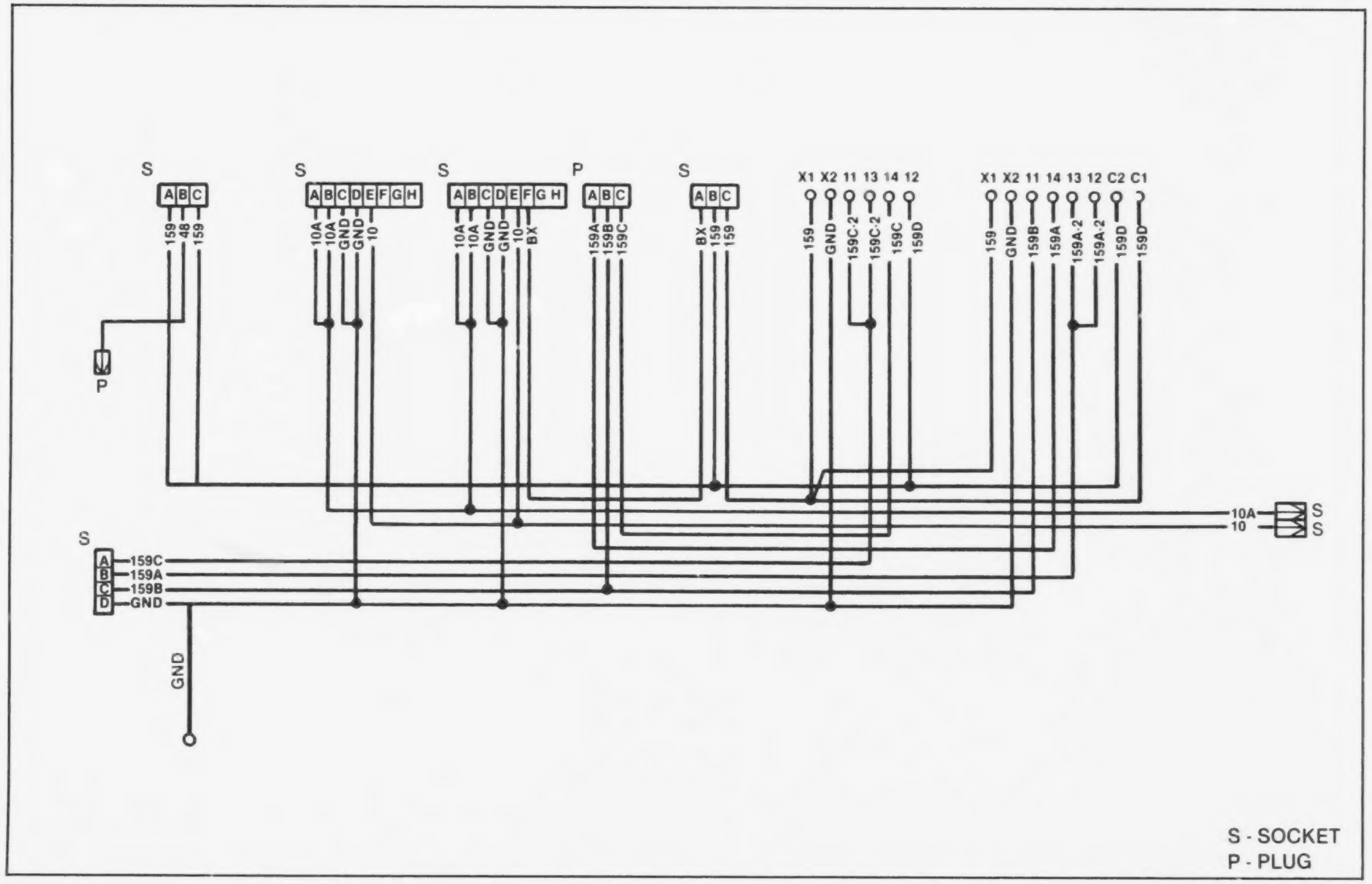
Reverse disassembly procedures.

INSTALLATION

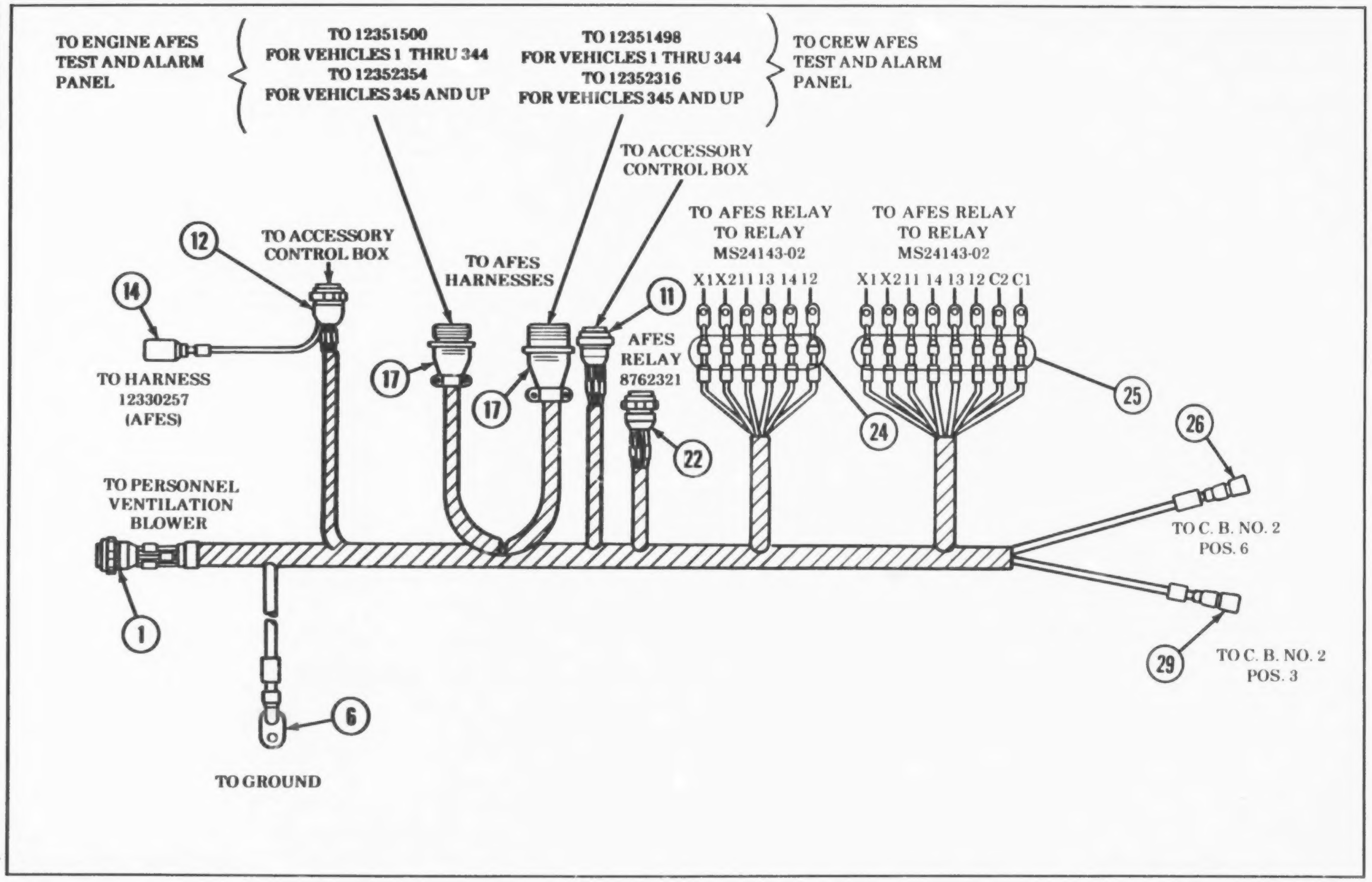
Reverse removal procedures.

TA311123

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


S
A B C
159
48
159
P
S
A B C D E F G H
10A
10A
GND
GND
10
S
A B C D E F G H
10A
10A
GND
GND
10
BX
P
A B C
159A
159B
159C
S
A B C
BX
159
159
X1 X2 11 13 14 12
159
GND
159C-2
159C-2
159C
159D
X1 X2 11 14 13 12 C2 C1
159
GND
159B
159A
159A-2
159A-2
159D
159D
10A
10
S
S
S
A
B
C
D
159C
159A
159B
GND
GND
S - SOCKET
P - PLUG

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


TO ENGINE AFES TEST AND ALARM PANEL
TO 12351500 FOR VEHICLES 1 THRU 344
TO 12352354 FOR VEHICLES 345 AND UP
TO 12351498 FOR VEHICLES 1 THRU 344
TO 12352316 FOR VEHICLES 345 AND UP
TO CREW AFES TEST AND ALARM PANEL
TO ACCESSORY CONTROL BOX
TO AFES RELAY TO RELAY MS24143-02
TO AFES RELAY TO RELAY MS24143-02
X1 X2 11 13 14 12
X1 X2 11 14 13 12 C2 C1
12
TO ACCESSORY CONTROL BOX
14
TO AFES HARNESSES
11
AFES RELAY 8762321
17
17
TO HARNESS 12330257 (AFES)
22
24
25
26
TO PERSONNEL VENTILATION BLOWER
TO C. B. NO. 2 POS. 6
1
29
TO C. B. NO. 2 POS. 3
6
TO GROUND

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

Connector Number	Electrical Lead To:	Wire No.	Connector Number	Electrical Lead To:	Wire No.
1	Personnel ventilation blower	159C, 159A, 159B, GND	22	AFES relay - 8762321	BX, 159, 159
6	Ground	GND	24	AFES relay - MS24143-D2	X1, X2, 11, 13, 14, 12
11	Accessory control box	159A, 159B, 159C	25	AFES relay - MS24143-D2	X1, X2, 11, 14, 13, 12, C2, C1
12	Accessory control box	159, 159, 48	26	Circuit breaker panel no. 2 circuit breaker position no. 6	10A
14	AFES Harness 12330257	48			
17	AFES Harness 12351500 Harness 12351498 } For vehicles 1 thru 344	10A 10A GND, GND, 10	29	Circuit breaker panel no. 2 circuit breaker position no. 3	10
	Harness 12352354 Harness 12352316 } For vehicles 345 and up	10A, 10A GND, GND, 10, BX			

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

INITIAL SETUP

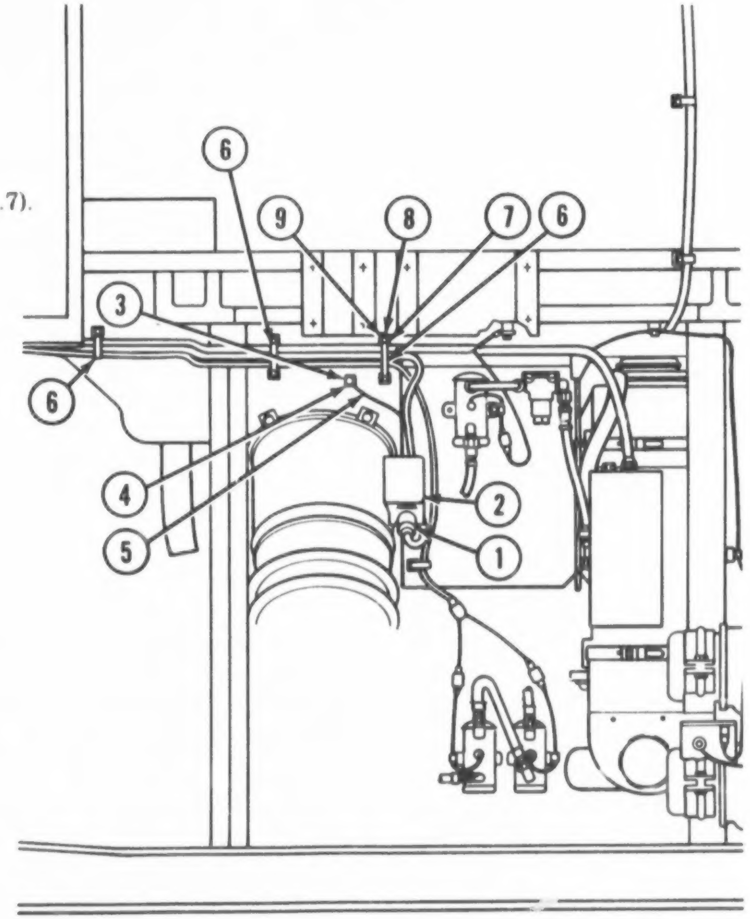
Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.
Engine AFES deactivated (p 14-14.3) and Crew AFES deactivated (p 14-14.7).
Left projectile rack moved toward rear of vehicle (TM 9-2350-267-10).

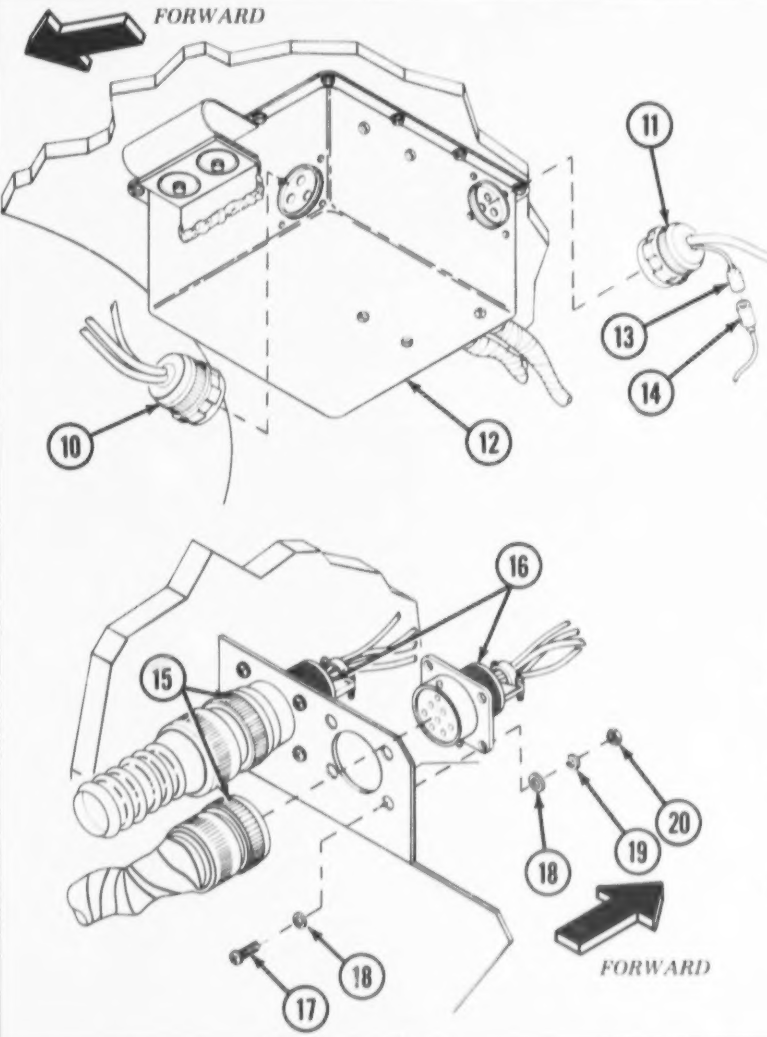
General Safety Instructions:

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottle with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.



ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



REMOVAL

A Disconnect harness plug (1) from personnel ventilation blower (2).

B Remove screw (3) and two lockwashers (4) and disconnect ground wire (5) from forward bulkhead. Discard lockwashers.

C From each of three strap assemblies (6), remove one screw (7), one flat washer (8), and one lockwasher (9). Separate harness from other harnesses. Reinstall strap assemblies (6). Discard lockwashers.

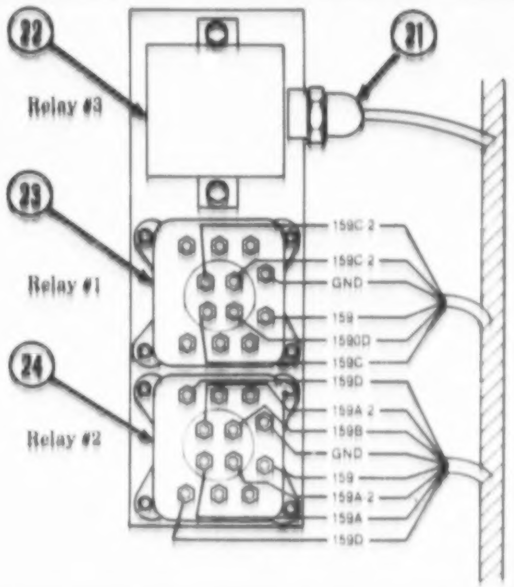
D Disconnect harness plugs (10 and 11) from accessory control box (12).

E Disconnect harness connector (13) from connector of harness 12330257, CKT 48 (14).

F Disconnect two AFES harness plugs (15) from bracket-mounted connectors (16) (12351500 and 12351498 for vehicles 1 thru 344; 12352354 and 12352316 for vehicles 345 and above).

G Remove each bracket-mounted connector (16) by removing from each four screws (17), eight flat washers (190, four lockwashers (19), and four nuts (20). Discard lockwashers.

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

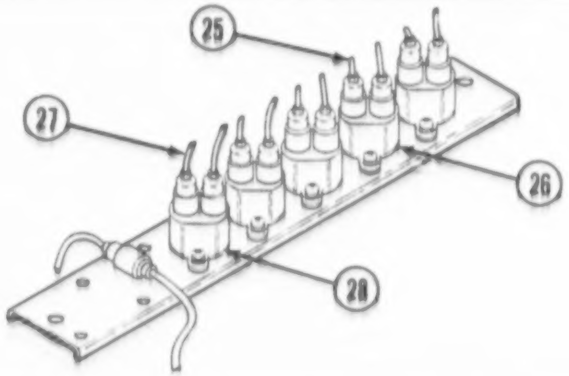

22
21
Relay #3
23
Relay #1
159C 2
159C 2
GND
159
159DD
159C
159D
24
Relay #2
159A 2
159B
GND
159
159A 2
159A
159D

H Remove relay covers (p 14-35).

I Disconnect harness plug (21) from AFES relay no. 3 (22).

J Disconnect six harness terminals from relay no. 1 (23).

K Disconnect eight harness terminals from relay no. 2 (24).



L Disconnect harness circuit 10A (25) from circuit breaker panel no. 2, circuit breaker no. 6 (26).

M Disconnect harness circuit 10 (27) from circuit breaker panel no. 2, circuit breaker no. 3 (28).

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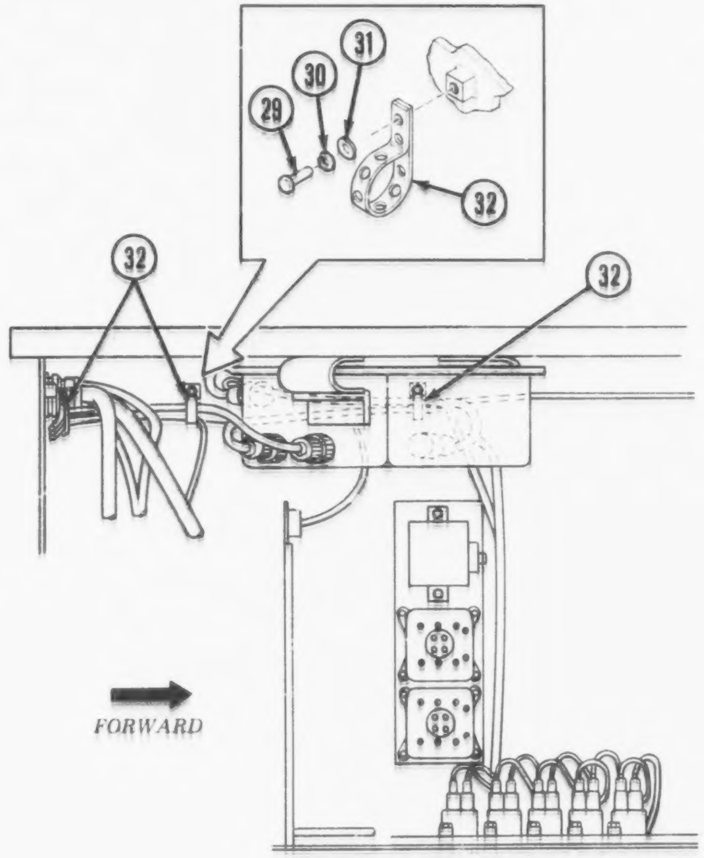
ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



N Remove three screws (29), three lockwashers (30), three flat washers (31) and three strap assemblies (32). Separate harnesses and reinstall strap assemblies.

O Remove harness 12351461 from vehicle.

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

A Reassemble wiring branch (p 2-307).

B Regroup wiring branches and secure with electrical tape (item 60, Appx D).

INSTALLATION

A Install harness 12351461 to vehicle.

B Install three screws (29), three new lockwashers (30), three flat washers (31), and three strap assemblies (32).

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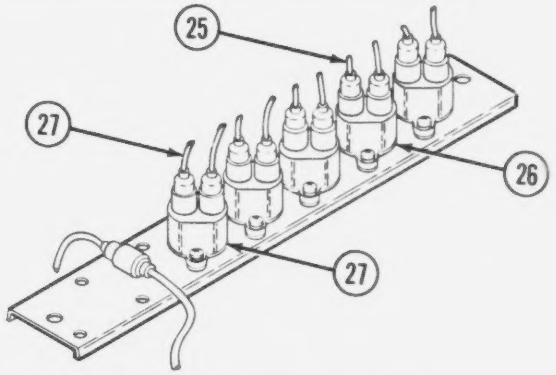
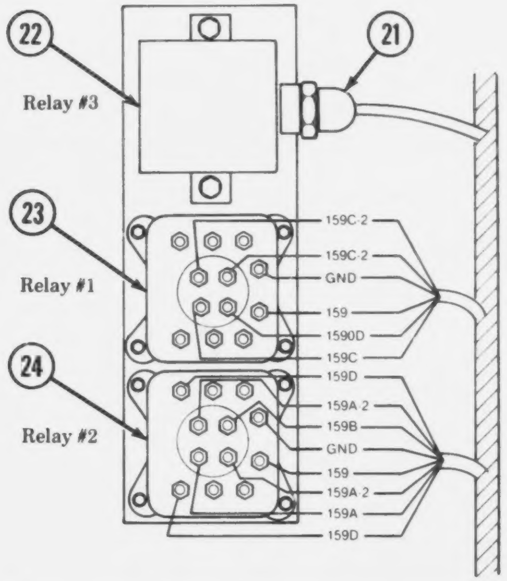
ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



C Connect harness circuit 10 (27) to circuit breaker panel no. 2, circuit breaker no. 3 (28).

D Connect harness circuit 10A (25) to circuit breaker panel no. 2, circuit breaker no. 6 (26).


22
Relay #3
21
23
Relay #1
24
Relay #2
159C-2
159C-2
GND
159
1590D
159C
159D
159A-2
159B
GND
159
159A-2
159A
159D

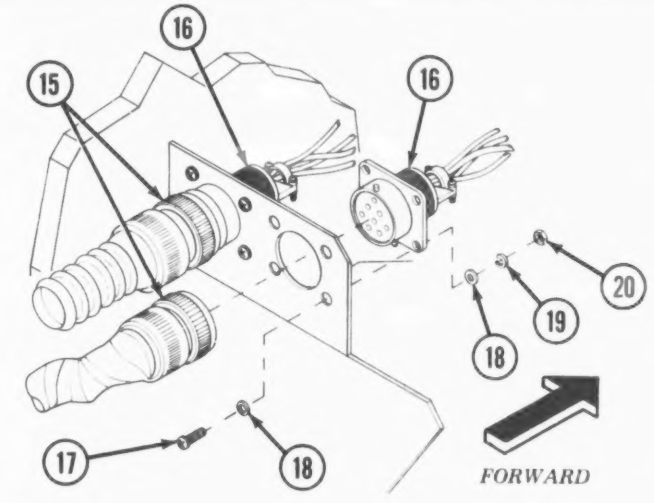
E Connect eight harness terminals to relay no. 2 (24).

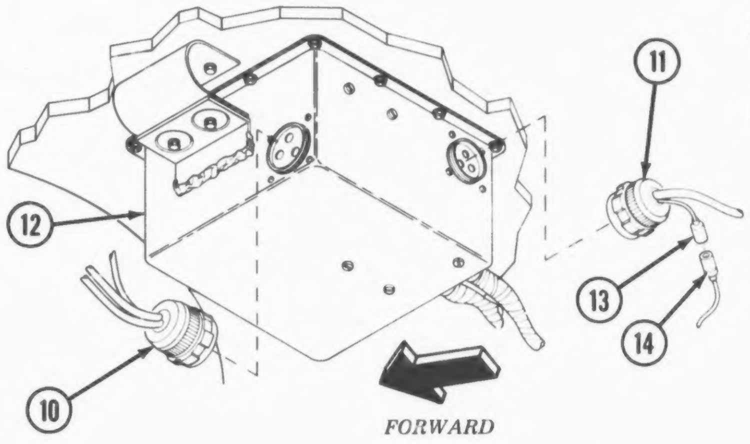
F Connect six harness terminals to relay no. 1 (23).

G Connect harness plug (21) to AFES relay no. 3 (22).

H Install relay covers (p 14-35).

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)





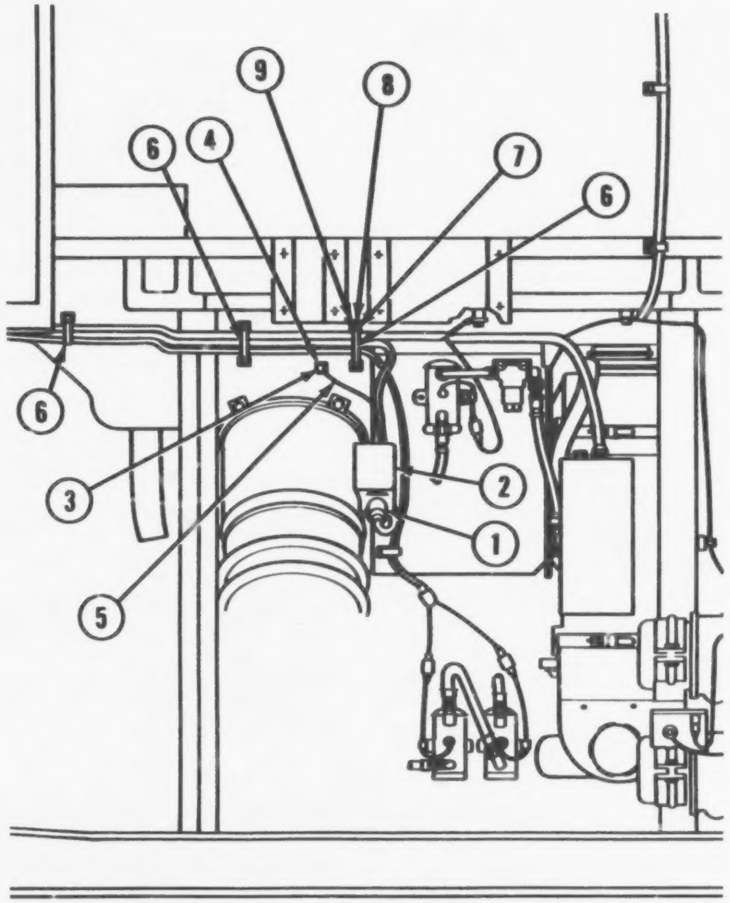
I Install each bracket-mounted connector (16) by installing to each, four screws (17), with flat washers (18), four new lockwashers (19), and four nuts (20).

J Connect two AFES harness plugs (15) to two bracket-mounted connectors (16) (12351500 and 12351498 for vehicles 1 thru 344; 12352354 and 12352316 for vehicles 345 and above).

K Connect harness connector (13) to connector on harness 12330257, CKT 48 (14).

L Connect harness plugs (10 and 11) to accessory control box (12).

ACCESSORY CONTROL BOX TO AFES HARNESSES, AFES RELAYS AND PERSONNEL VENTILATION BLOWER WIRING HARNESS (12351461): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



M Install screw (7), flat washer (8) and new lockwasher (9) to each of three strap assemblies (6).

N Connect ground wire (5) to forward bulkhead and secure it by installing two new lockwashers (4) and screw (3).

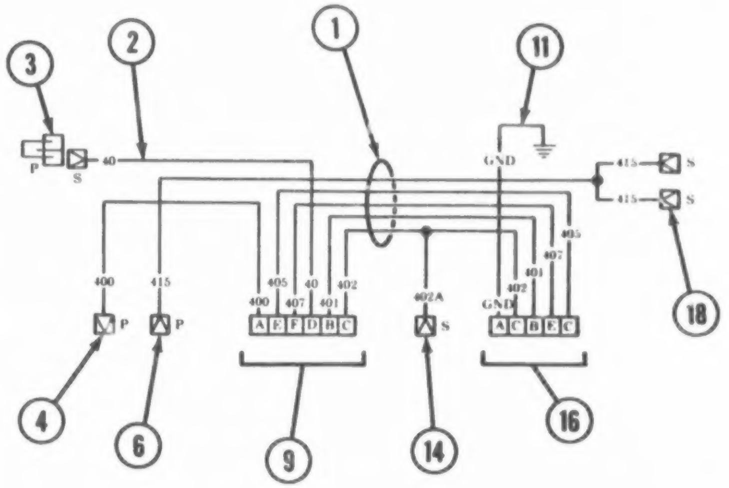
O Connect harness plug (1) to personnel ventilation blower (2).

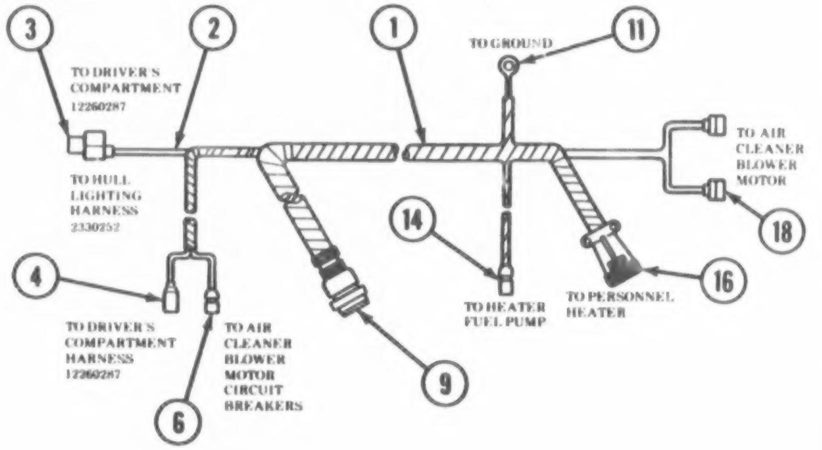
P Connect ground cable (6-44).

Q Reactivate engine AFES (p 14-14.5) and crew AFES (p 14.14.8).

R Move left projectile rack toward front of vehicle (TM 9-2350-267-10).

ACCESSORY CONTROL BOX TO HEATER, BLOWERS, HULL LIGHTING CIRCUITS WIRING HARNESS (12351544): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


3
2
1
11
P
S
40
GND
415
S
415
S
18
400
415
405
40
402
400
407
401
402A
GND
402
404
407
405
P
P
S
A E F D B C
A C B E C
4
6
9
14
16


3
2
1
11
TO GROUND
TO DRIVER'S COMPARTMENT 12260287
TO HULL LIGHTING HARNESS 2330252
TO AIR CLEANER BLOWER MOTOR
18
14
16
4
TO DRIVER'S COMPARTMENT HARNESS 12260287
TO AIR CLEANER BLOWER MOTOR CIRCUIT BREAKERS
6
9
TO HEATER FUEL PUMP
TO PERSONNEL HEATER

Connector Number	Electrical Lead To:	Wire No.
1	Harness 12351544	
2	Hull lighting electrical lead	40
3	Harness 12260287/12330252 40 connector	
4	Driver's compartment harness 12260287	400
6	Air cleaner blower motor circuit breaker 6, panel 1	415
9	Accessory control box connector	400, 405, 407 40, 401, 402

Connector Number	Electrical Lead To:	Wire No.
11	Ground	GND
14	Heater fuel pump	402A
16	Personnel heater connector	GND, 402, 401, 407, 405
18	Air cleaner blowers (2)	415
S	Socket	
P	Plug	

TA57198

ACCESSORY CONTROL BOX TO HEATER, BLOWERS, HULL LIGHTING CIRCUITS WIRING HARNESS (12351544): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

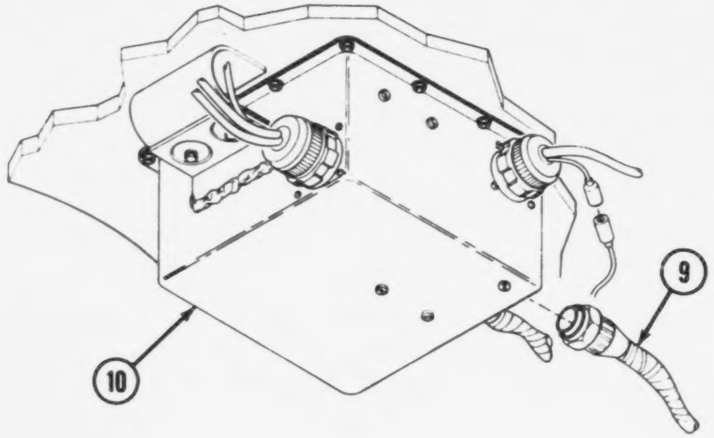
INITIAL SETUP

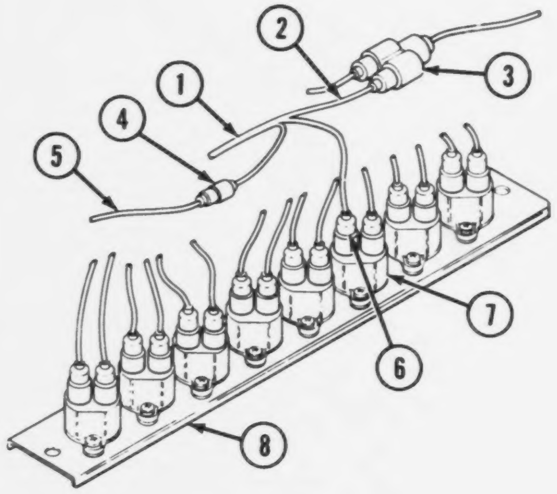
Parts/Materials:

Electrical tape (item 60, Appx D)

Equipment Condition:

Battery ground cables disconnected (p 6-44).
MASTER switch OFF.
Portable instrument panel removed (p 6-19).
Projectile racks removed (TM 9-2350-267-10).





REMOVAL

A Disconnect harness (1) lead 40 (2) from connector (3).

B Disconnect harness connector 400 (4) from wire 400 of harness 12260287 (5).

C Disconnect harness connector 415 (6) from circuit breaker (7) on circuit breaker panel no. 1 (8).

D Disconnect harness plug (9) from accessory control box (10).

TA57213

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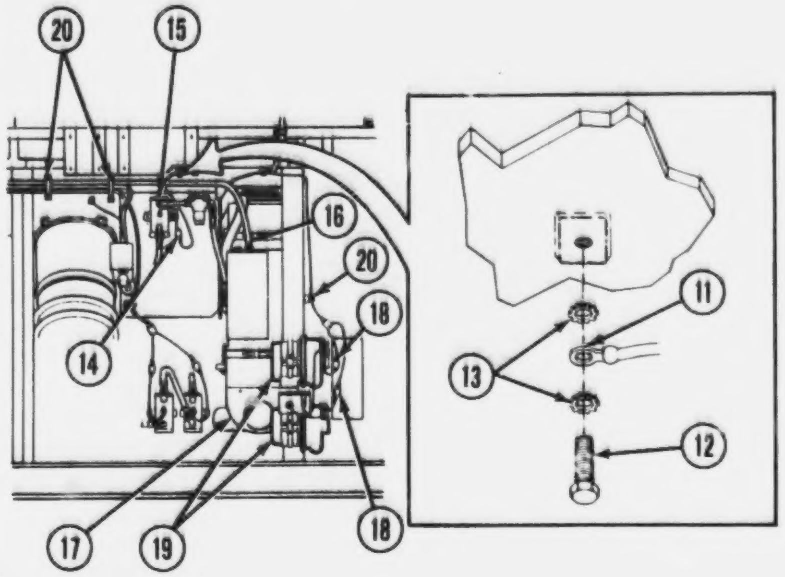
ACCESSORY CONTROL BOX TO HEATER, BLOWERS, HULL LIGHTING CIRCUITS WIRING HARNESS (12351544): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



E Remove harness ground lug (11) by removing one screw (12) and two washers (13).

F Disconnect harness connector 402A (14) from personnel heater fuel pump (15).

G Disconnect harness plug (16) from personnel heater (17).

H Disconnect two harness connectors 415 (18) from connectors on air cleaner blower motors (19).

I Remove harness straps (20) that secure harness to vehicle by removing screws and washers. Do not remove other harnesses secured by straps. Replace hardware after harness removal.

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

A Reassemble wiring branch.

B Regroup wiring branches and secure with electrical tape (item 60, Appx D).

INSTALLATION

A Install harness straps (20).

B Connect two harness connectors 415 (18) to connectors on air cleaner blower motors (19).

C Connect harness plug (16) to personnel heater (17).

TA57199

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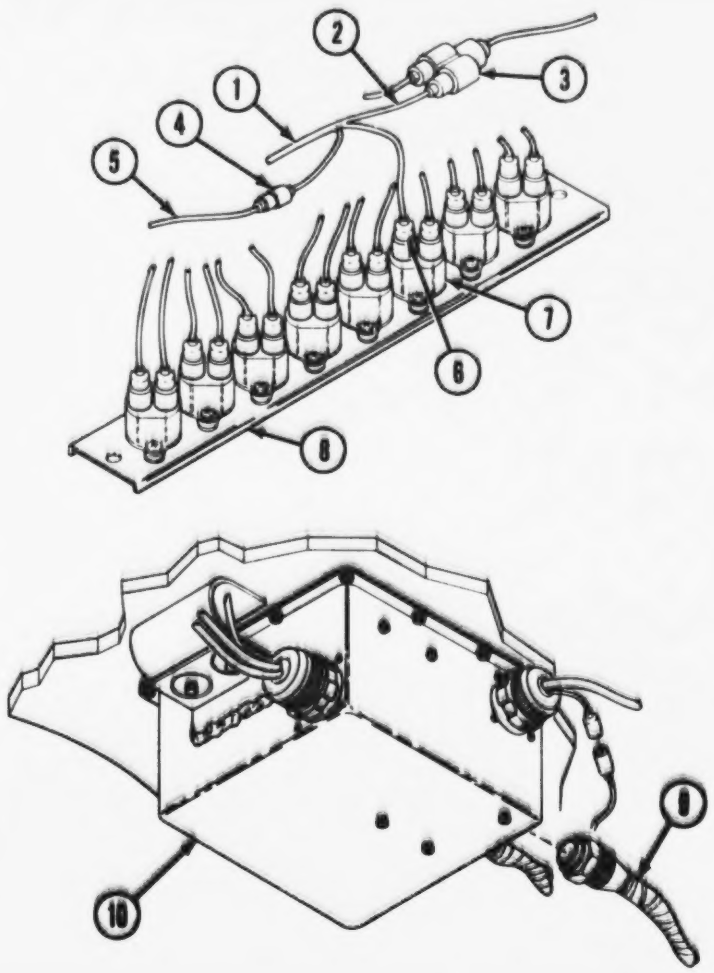
ACCESSORY CONTROL BOX TO HEATER, BLOWERS, HULL LIGHTING CIRCUITS, WIRING HARNESS (12351544): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



D Connect harness connector 402A (14) to personnel heater fuel pump (15).

E Install harness ground lug (11) by installing screw (12) and two washers (13).

F Connect harness plug (9) to accessory control box (10).

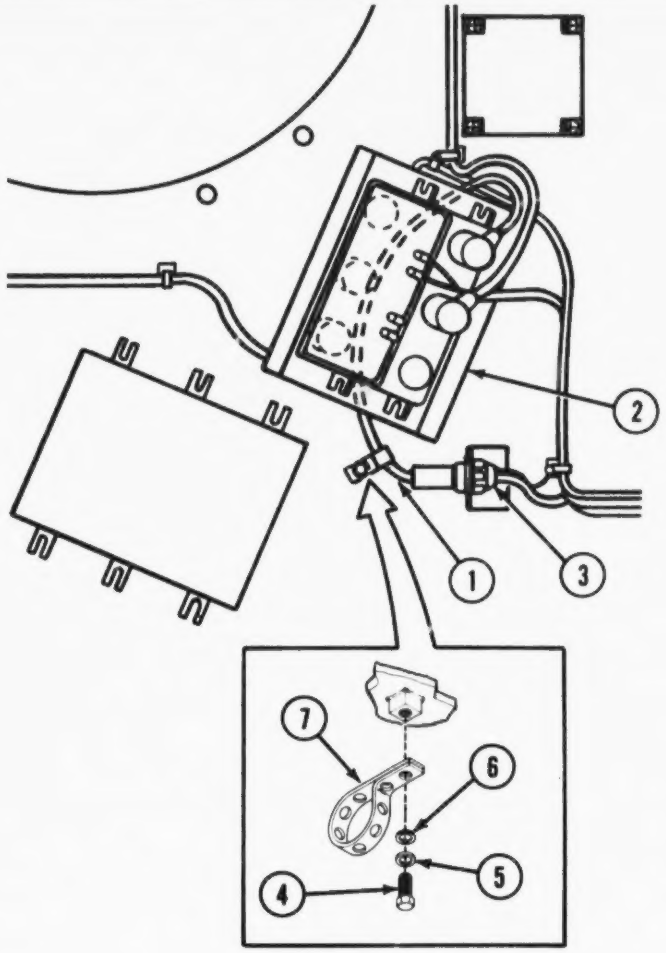
G Connect harness connector 415 (6) to circuit breaker (7) on circuit breaker panel no. 1 (8).

H Connect harness connector 400 (4) to wire 400 of harness 12260287 (5).

I Connect harness (1) lead 40 (2) to connector (3).

TA57200

INTERCOM POWER CABLE CX13089/VRC — 2 FT: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect power cable (1) from intercom amplifier power supply (2) and 12330257 lead 48 receptacle (3).

B Remove screw (4), lockwasher (5), flatwasher (6) and strap (7).

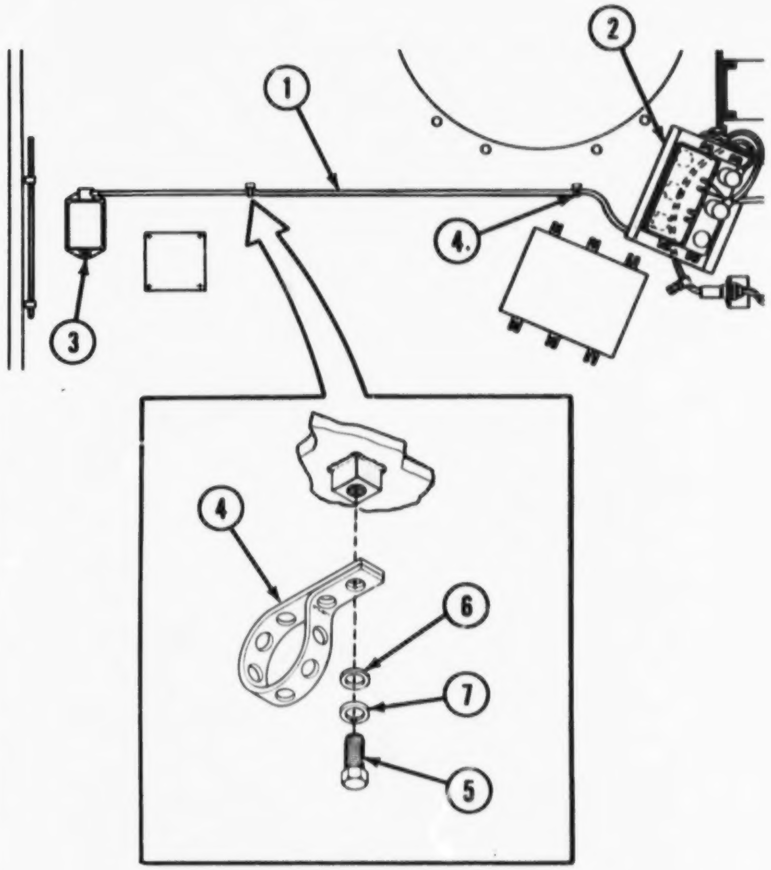
C Remove cable (1).

INSTALLATION

Reverse removal procedures.

TA311134

INTERCOM CABLE CX4723/VRC — 6 FT: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cable.

A Disconnect cable (1) connectors from intercom amplifier power supply (2) and rear crew compartment intercom control box (3).

B Remove two retaining straps (4) by removing two screws (5), two flat washers (6) and two lockwashers (7).

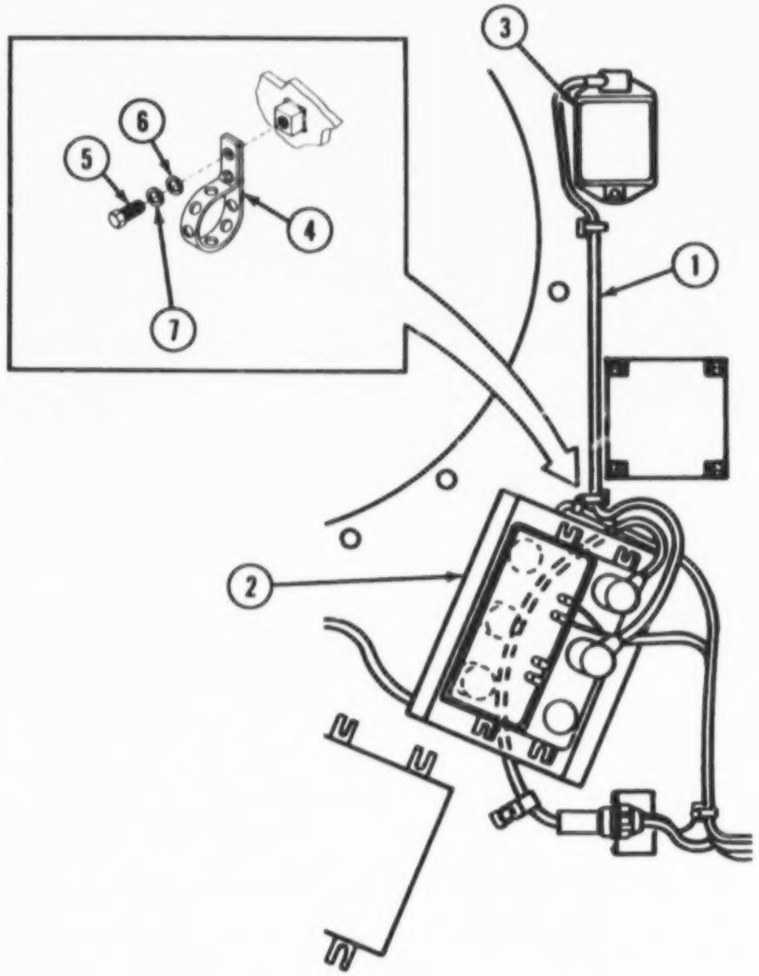
C Remove cable (1).

INSTALLATION

Reverse removal procedures.

TA311135

INTERCOM CABLE CX4723/VRC — 4 FT: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cable.

A Disconnect cable (1) connectors from intercom amplifier power supply (2) and intercom control box (3).

B Remove three retaining straps (4) from cable (1) by removing one screw (5), one flat washer (6) and one lockwasher (7) from each.

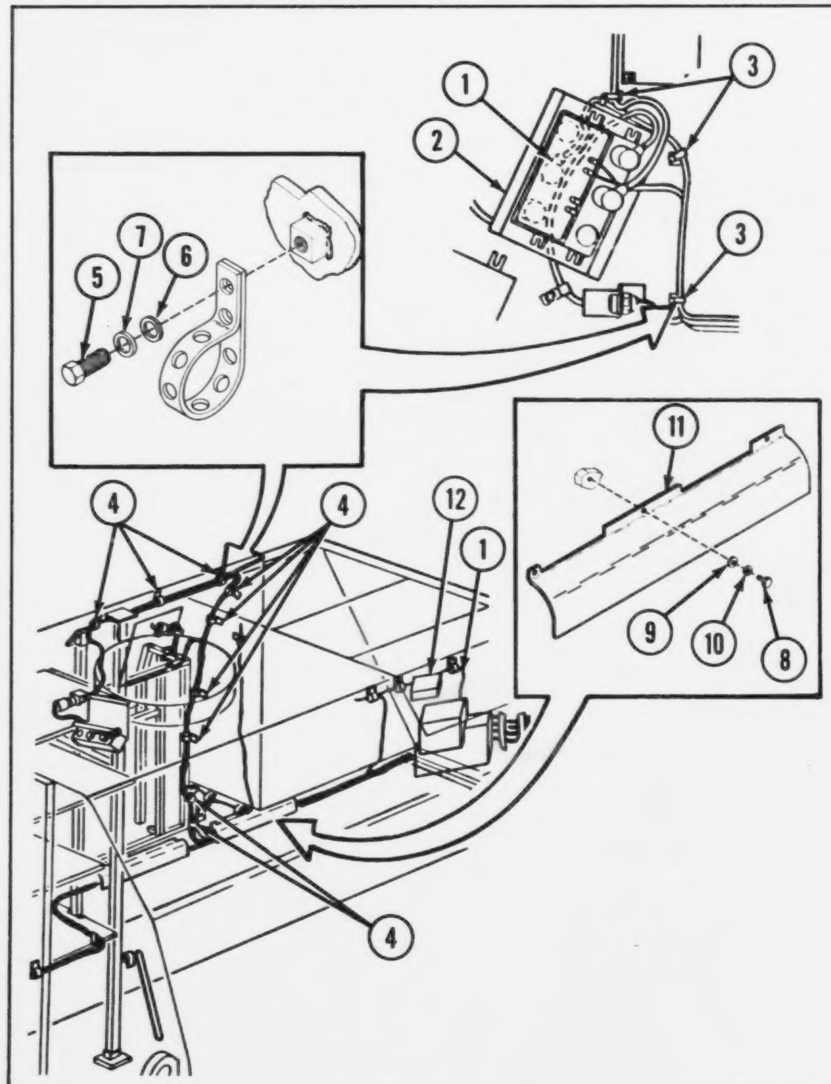
C Remove cable (1) from vehicle.

INSTALLATION

Reverse removal procedures.

TA311136

INTERCOM CABLE CX4723/VRC — 20 FT: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cable.

A Disconnect cable (1) connector from intercom amplifier power source (2).

B Remove three retaining straps (3) from cable (1) and nine retaining straps (4) by removing one screw (5), one flat washer (6) and one lockwasher (7) from each strap.

NOTE

Do not remove other wiring harnesses from retaining straps. Reinstall straps, screws and washers.

C Remove three screws (8), three flat washers (9), three lockwashers (10) and guard (11).

D Disconnect cable (1) from driver's intercom (12).

E Remove cable (1) from vehicle.

INSTALLATION

Reverse removal procedures.

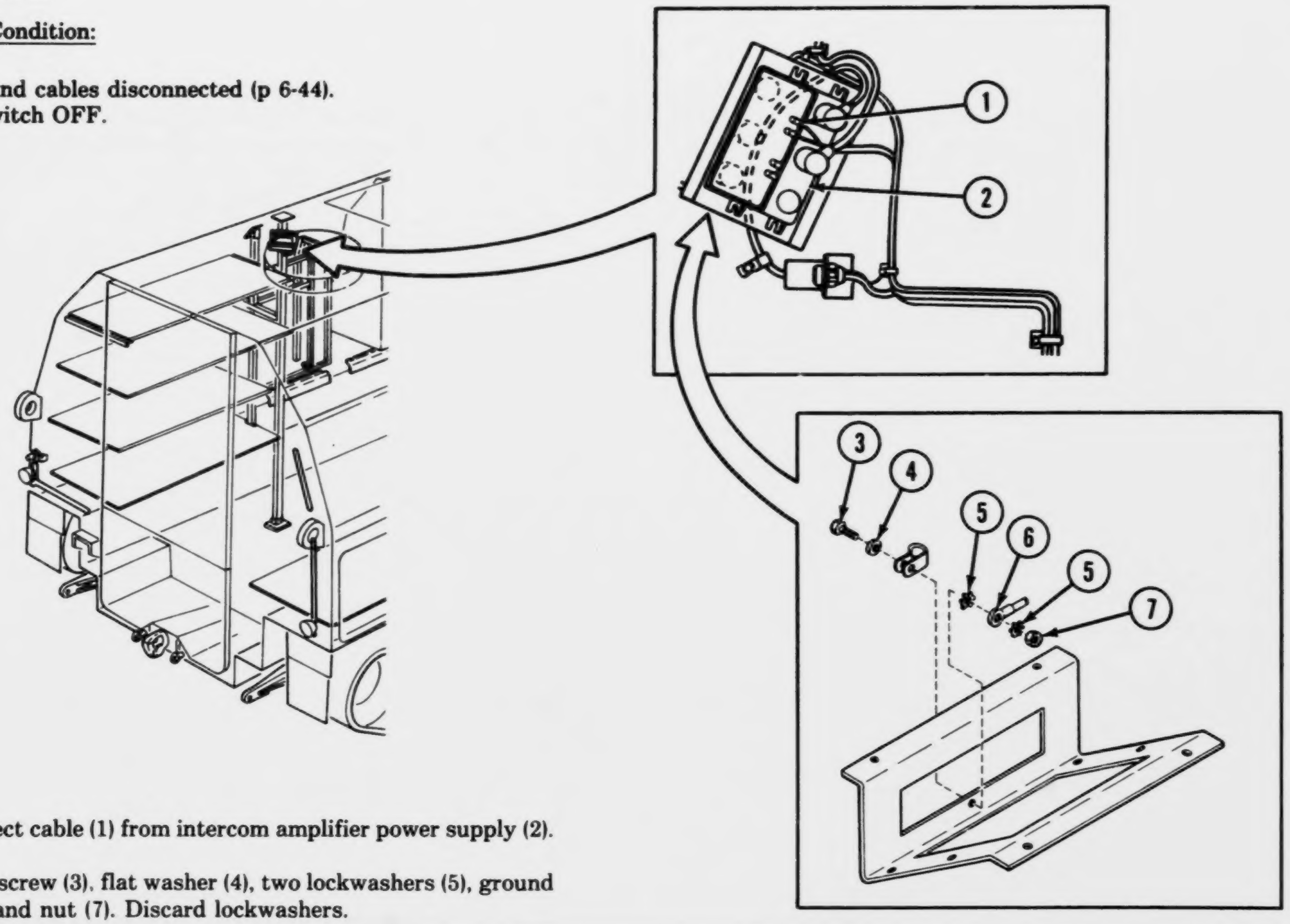
TA311137

TELEPHONE WIRING HARNESS (12330024): REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (p 6-44).
MASTER switch OFF.

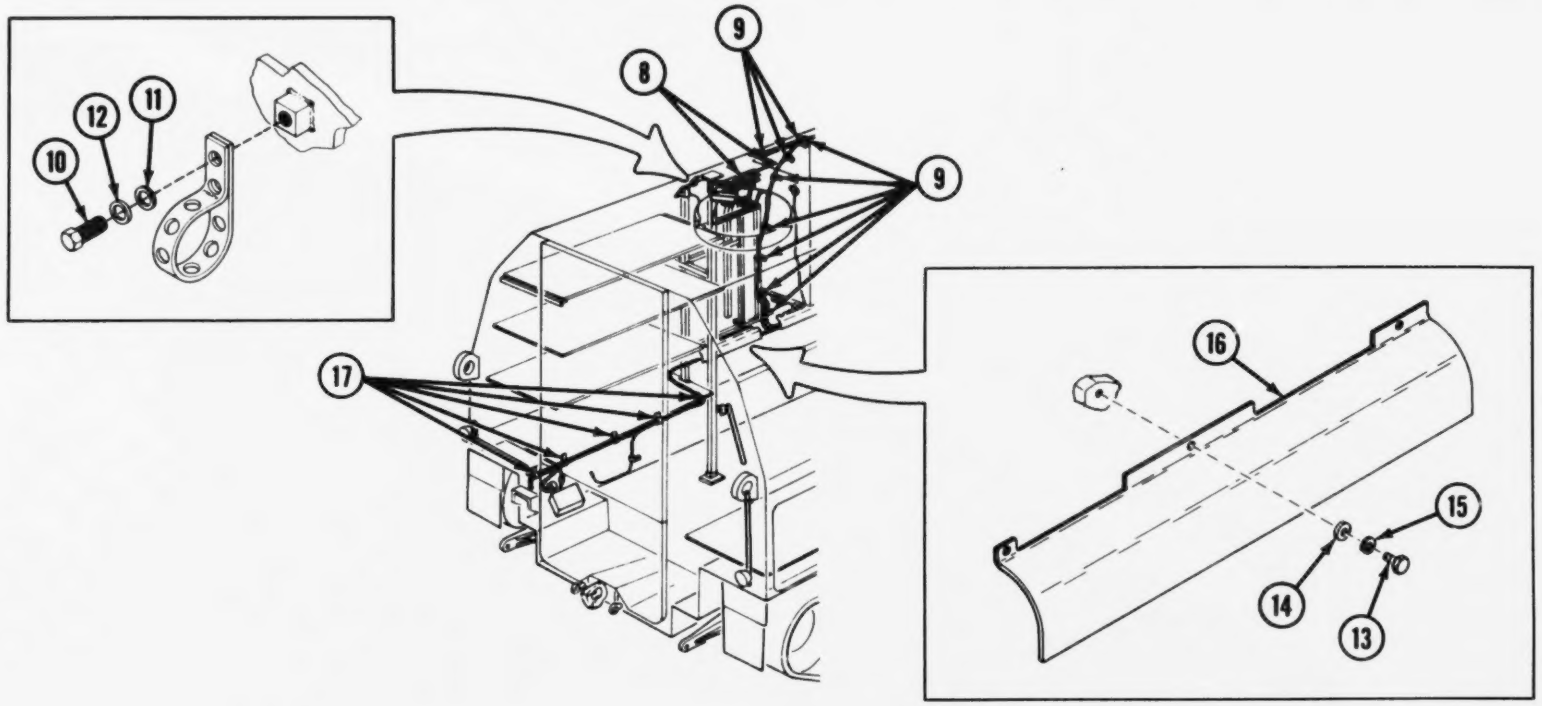


REMOVAL

A Disconnect cable (1) from intercom amplifier power supply (2).

B Remove screw (3), flat washer (4), two lockwashers (5), ground wire (6) and nut (7). Discard lockwashers.

■ TELEPHONE WIRING HARNESS (12330024): REMOVAL AND INSTALLATION (CONTINUED)



C Remove two retaining straps (8) and nine retaining straps (9), by removing one screw (10), one flat washer (11) and one lockwasher (12) from each strap. Discard lockwashers.

NOTE

Do not remove other wiring harnesses from retaining straps. Reinstall straps, screws and washers.

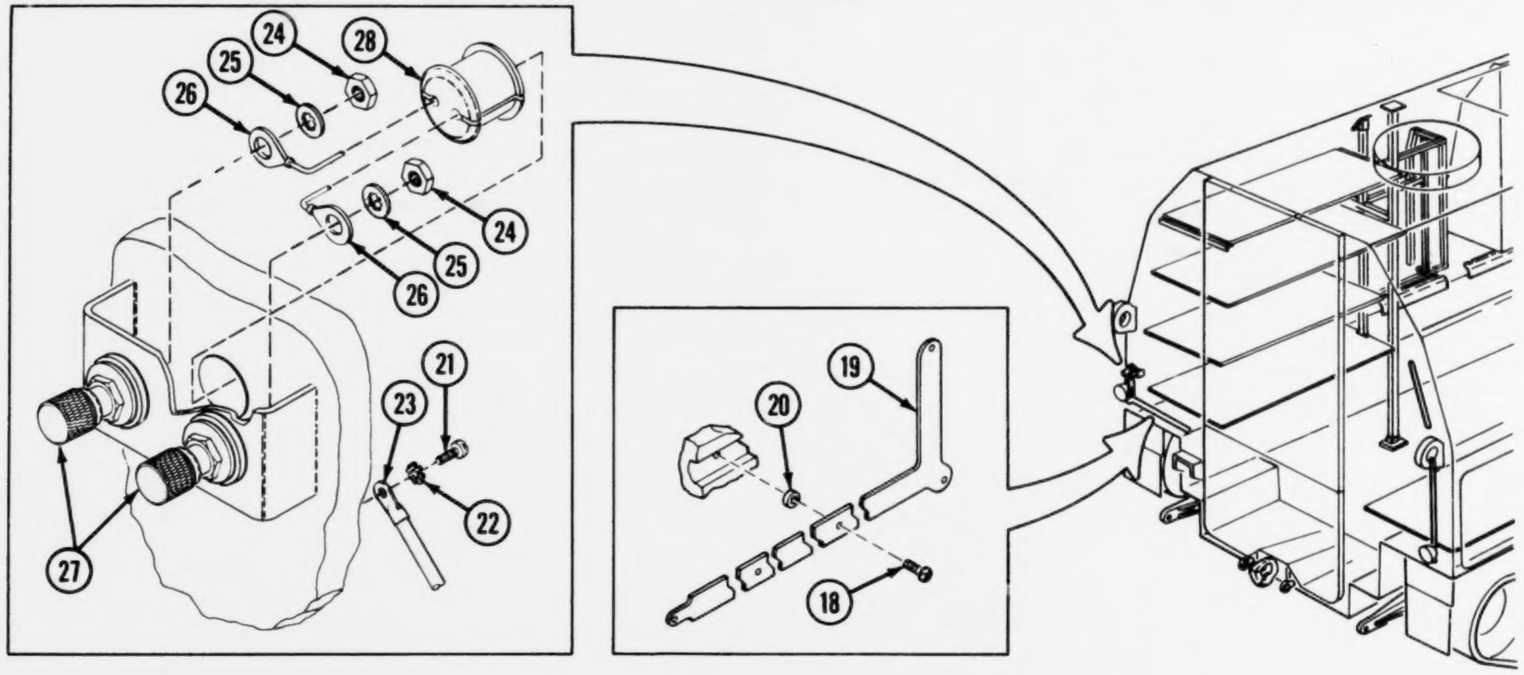
D Place left crew seat in deployed position and remove four screws (13), four flat washers (14), four lockwashers (15) and guard (16). Discard lockwashers.

E Remove NBC air purifier (p 14-3).

F Remove five retaining strap assemblies (17).

TA57202

■ TELEPHONE WIRING HARNESS (12330024): REMOVAL AND INSTALLATION (CONTINUED)



G Remove five screws (18), cover (19) and five spacers (20).

H Remove screw (21) and washer (22) to release ground wire (23).

I Remove two nuts (24) and two lockwashers (25) and remove cable terminal leads (26) from intercom terminals (27). Discard lockwashers.

J Remove rubber grommet (28) and cable terminal leads (26) from rear of vehicle. Separate cable terminal leads (26) from grommet (28).

INSTALLATION

A Install cable terminal leads (26) in rubber grommet (28). Install rubber grommet (28) and cable terminal leads (26) on rear of vehicle.

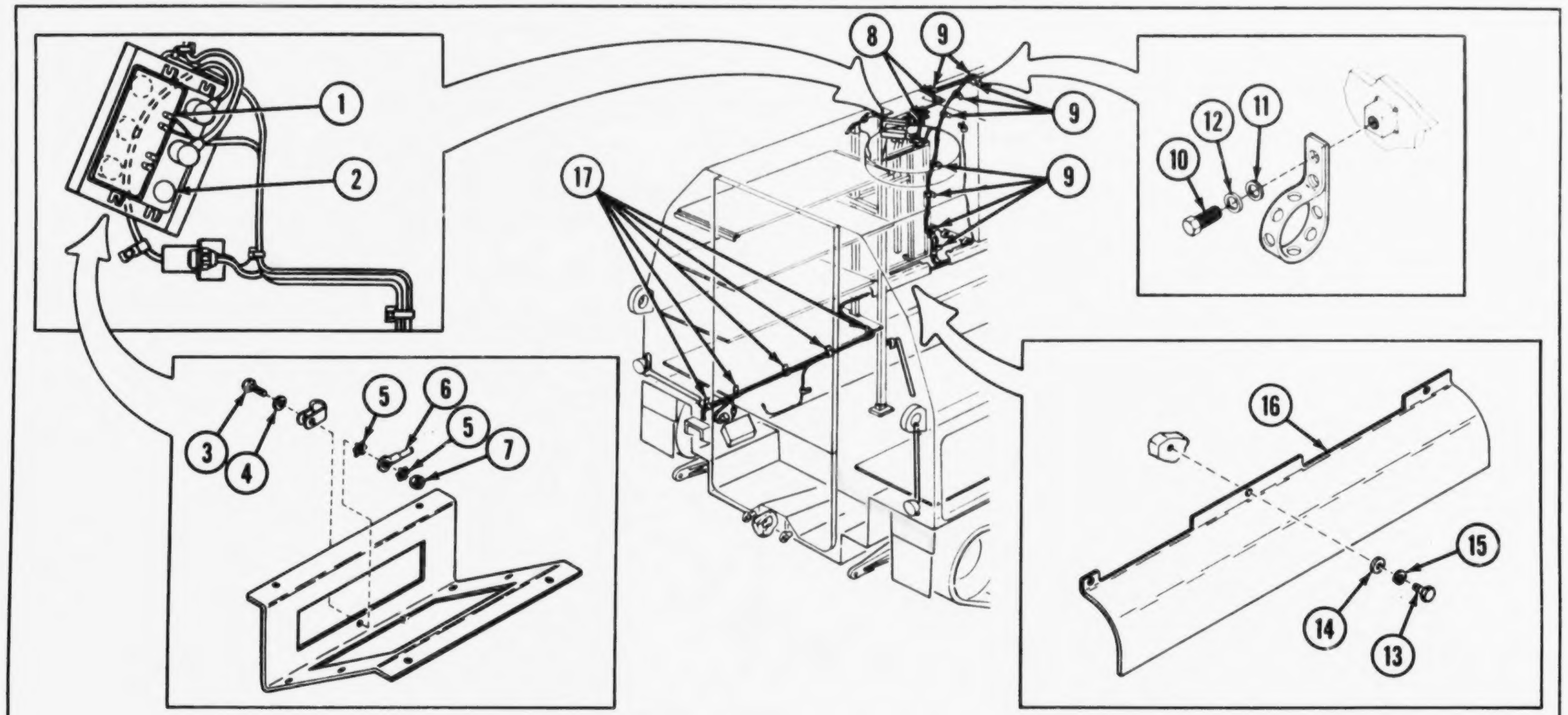
B Install cable terminal leads (26) on intercom terminals (27) with two new lockwashers (25) and two nuts (24).

C Install screw (21) and washer (22) to secure ground wire (23).

D Install five screws (18), cover (19) and five spacers (20).

TA57203

TELEPHONE WIRING HARNESS (12330024): REMOVAL AND INSTALLATION (CONTINUED)



E Install five retaining strap assemblies (17).

F Install NBC air purifier (p 14-3).

G Install guard (16), four new lockwashers (15), four flat washers (14) and four screws (13).

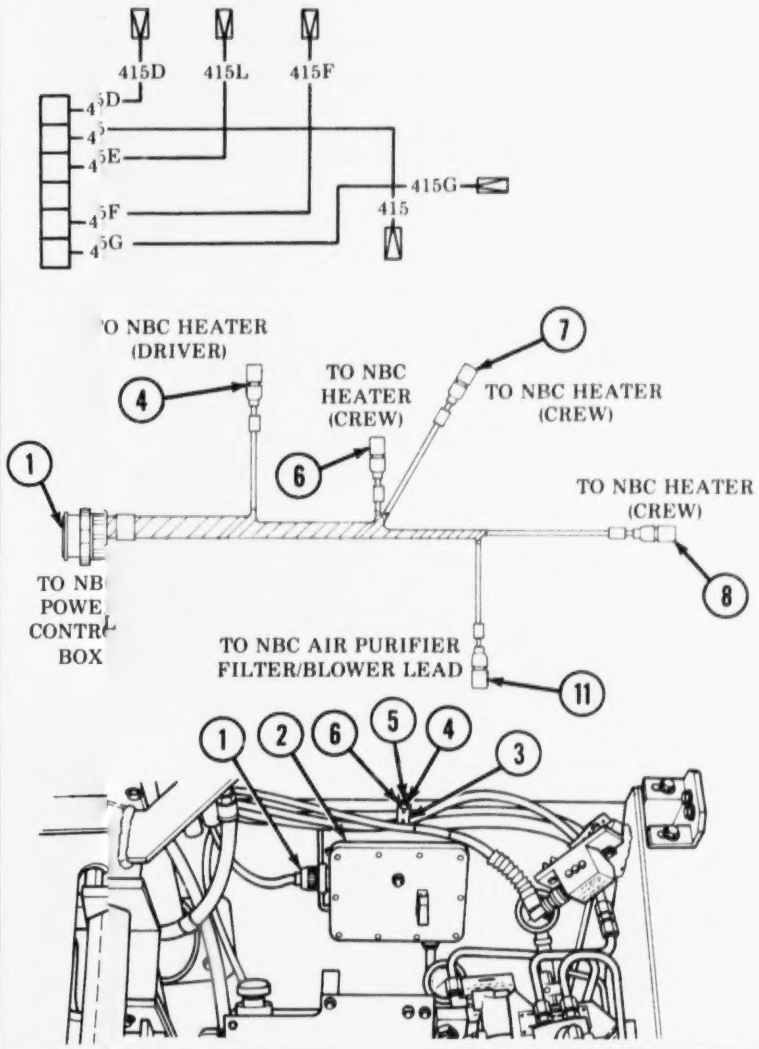
H Install two retaining straps (8) and nine retaining straps (9) with one screw (10), one flat washer (11) and one new lockwasher (12) for each strap.

I Install nut (7), ground wire (6), two new lockwashers (5), flat washer (4) and screw (3).

J Connect cable (1) to intercom amplifier power supply (2).

TA57204

NBC WI NG HARNESS (12330296): REMOVAL AND INSTALLATION


415D
415L
415F
5D
5E
5F
5G
415G
415
O NBC HEATER (DRIVER)
TO NBC HEATER (CREW)
TO NBC HEATER (CREW)
TO NBC HEATER (CREW)
TO NB POWE CONTR BOX
TO NBC AIR PURIFIER FILTER/BLOWER LEAD
1
2
3
4
5
6
7
8
11

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect plug (1) from NBC control box (2).

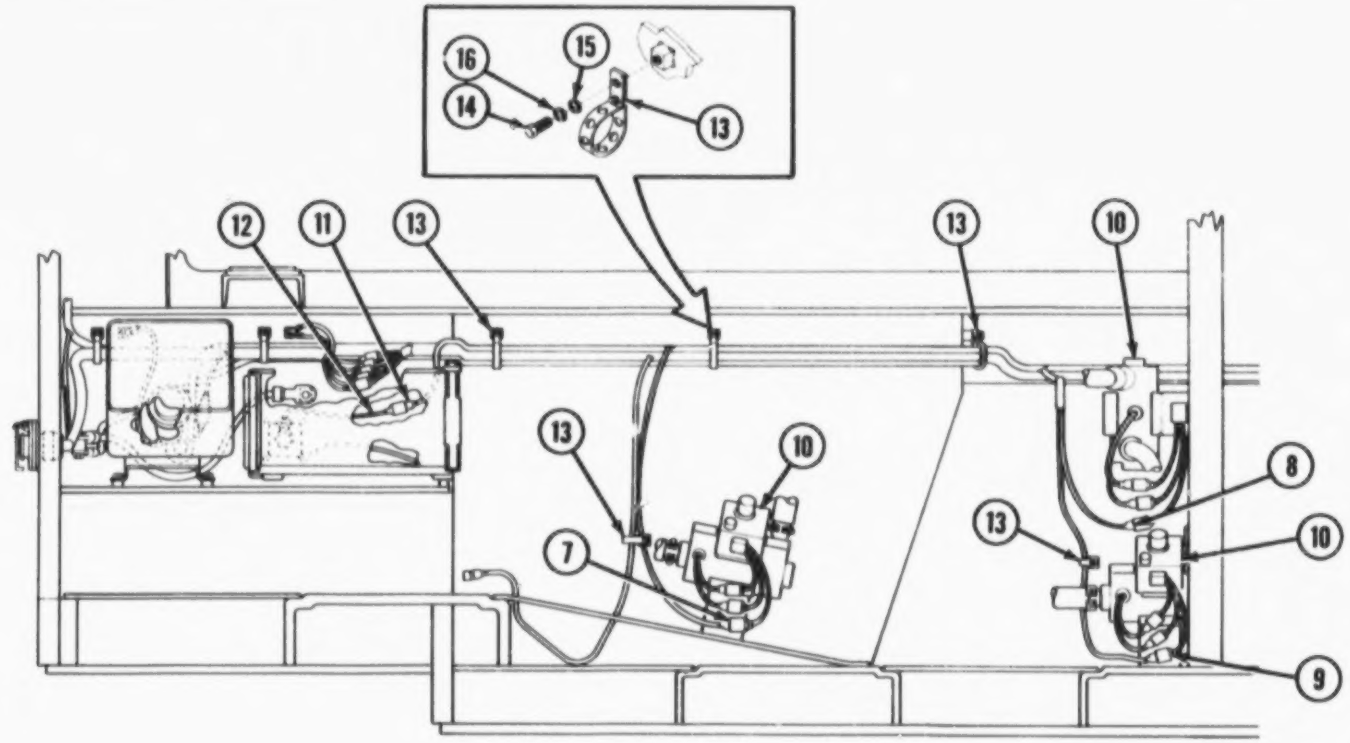
B Remove six retaining straps (3) by removing screw (4), flat washer (5) and lockwasher (6) from each strap.

NOTE

Do not remove other wiring harnesses from retaining straps. Reinstall straps, screws and washers.

TA311140

NBC WIRING HARNESS (12330296): REMOVAL AND INSTALLATION (CONTINUED)



C Disconnect harness connectors 415G (7), 415E (8) and 415F (9) from three crew compartment NBC heaters (10).

D Disconnect harness connector 415 (11) from NBC air purifier filter/blower 415 wire from harness 12330298 (12).

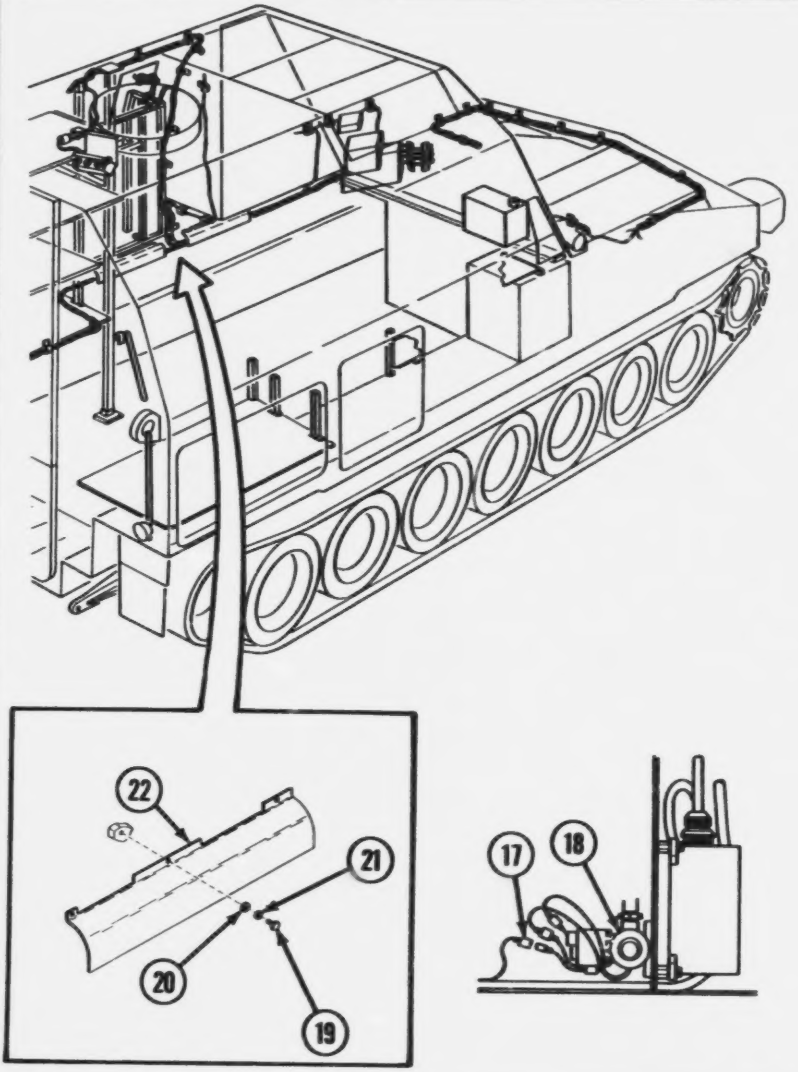
E Remove five retaining straps (13) by removing one screw (14), one flat washer (15) and one lockwasher (16) from each.

NOTE

Do not remove other wiring harnesses from strap assemblies. Reinstall retaining straps, screws and washers.

TA311141

NBC WIRING HARNESS (12330296): REMOVAL AND INSTALLATION (CONTINUED)



F Disconnect connector 415D (17) from driver's compartment NBC heater (18).

G Remove seven screws (19), seven flat washers (20), seven lockwashers (21) and two wiring harness guards (22).

H Remove wiring harness from vehicle.

INSTALLATION

Reverse removal procedures.

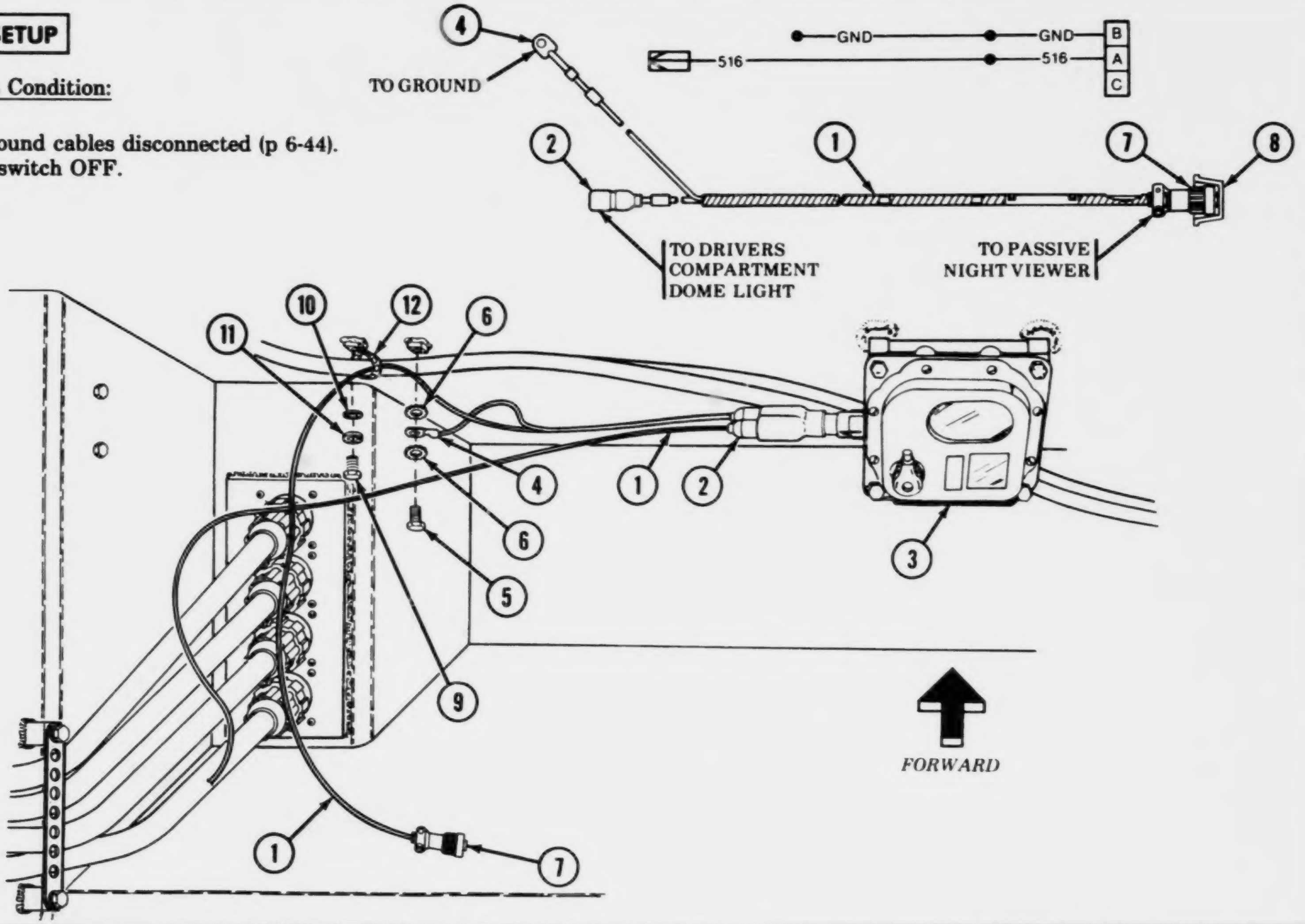
TA311142

DRIVER'S COMPARTMENT DOME LIGHT TO PASSIVE NIGHT VIEWER WIRING HARNESS (12332740): REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (p 6-44).
MASTER switch OFF.


4
TO GROUND
516
GND
GND
516
B
A
C
2
1
7
8
TO DRIVERS COMPARTMENT DOME LIGHT
TO PASSIVE NIGHT VIEWER
10
12
6
11
4
1
2
6
5
3
9
1
7
FORWARD

TA57205

DRIVER'S COMPARTMENT DOME LIGHT TO PASSIVE NIGHT VIEWER WIRING HARNESS (12332740): REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Disconnect harness (1) connector (2) from driver's compartment dome light connector (3).

B Disconnect harness ground wire (4) by removing one screw (5) and two lockwashers (6). Discard lockwashers.

C If connected, disconnect harness plug (7) from passive night viewer connector. Install protective cap (8) on plug (7).

D Remove one screw (9), one lockwasher (10), one flat washer (11) and one retaining strap (12). Discard lockwasher.

E Remove harness (1) from vehicle.

INSTALLATION

A Connect harness (1) to vehicle.

B Install one screw (9), new lockwasher (10), flat washer (11) and retaining strap (12).

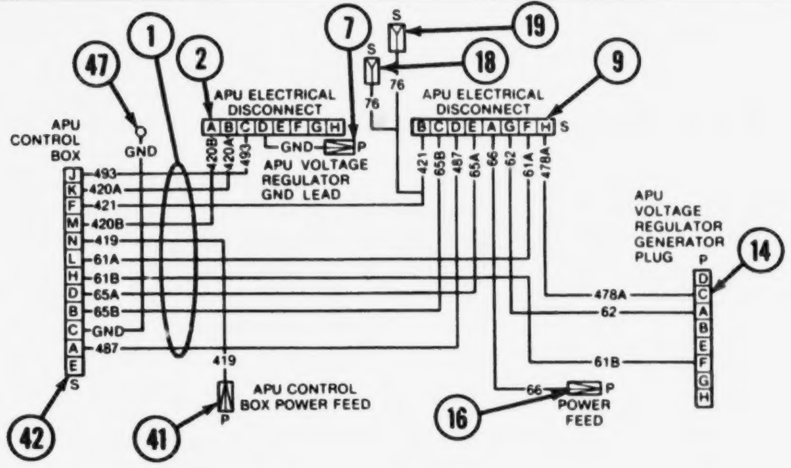
C Remove protective cap (8) from plug (7). Install plug (7) to passive night viewer connector.

D Install screw (5), two new lockwashers (6) and connect wiring harness ground wire (4).

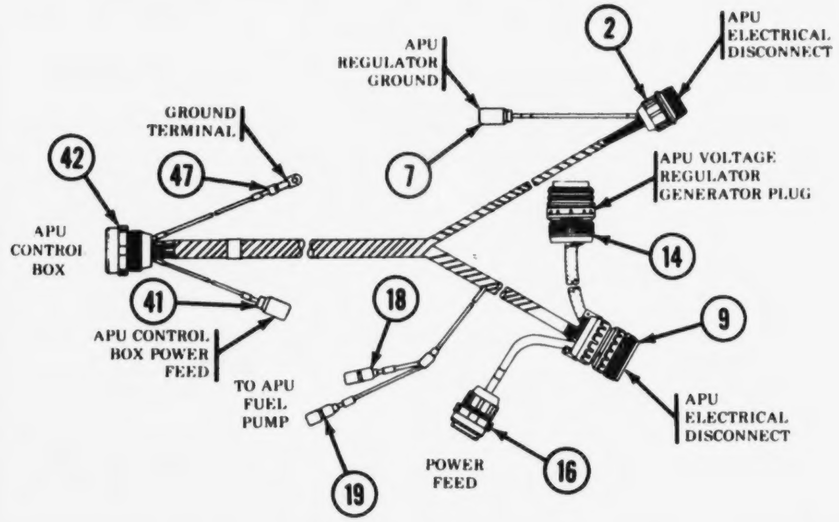
E Connect wiring harness (1) connector (2) to driver's compartment dome light connector (3).

TA57206

APU CONTROL BOX TO APU VOLTAGE REGULATOR WIRING HARNESS (12330248): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



47
1
2
7
19
18
9
APU CONTROL BOX
GND
APU ELECTRICAL DISCONNECT
A B C D E F G H
420B
420A
493
GND
P
APU VOLTAGE REGULATOR GND LEAD
S
76
76
APU ELECTRICAL DISCONNECT
B C D E A G F H
S
421
65B
487
65A
66
62
61A
478A
J K F M N L H D B C A E
493
420A
421
420B
419
61A
61B
65A
65B
GND
487
S
APU VOLTAGE REGULATOR GENERATOR PLUG
P
14
D C A B E F G H
478A
62
61B
419
APU CONTROL BOX POWER FEED
P
66
P
POWER FEED
42
41
16



2
APU ELECTRICAL DISCONNECT
APU REGULATOR GROUND
GROUND TERMINAL
42
47
7
APU VOLTAGE REGULATOR GENERATOR PLUG
APU CONTROL BOX
14
41
18
9
APU CONTROL BOX POWER FEED
TO APU FUEL PUMP
APU ELECTRICAL DISCONNECT
POWER FEED
16
19

Connector Number	Electrical Lead To:	Wire No.
1	Harness 12330248	
2	APU electrical disconnect	420B, 420A, 493, GND
7	APU regulator ground	GND
9	APU electrical disconnect	421, 65, 487, 65B, 66, 62, 478A
14	APU voltage regulator generator plug	478A, 62, 61B
16	APU power feed to lead 49 of harness 12330257	66
18	APU fuel pump	76
19	APU fuel pump	76
41	APU control box power feed from harness 12330252	419
42	APU control box	493, 420A, 421, 420B, 419, 61A, 61B, 65A,65B, GND, 487
47	Ground terminal	GND

TA57207

APU CO TROL BOX TO APU VOLTAGE REGULATOR WIRING HARNESS (12330248): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALL TION (CONTINUED)

INITI L SETUP

Parts/aterials:

Tape, ectrical (item 60, Appx D)

Equip ent Condition:

Batter ground cables disconnected (p 6-44).
MAST R switch OFF.
APU ntrol box removed (p 13-35).
Left p jectile rack removed (TM 9-2350-267-10).

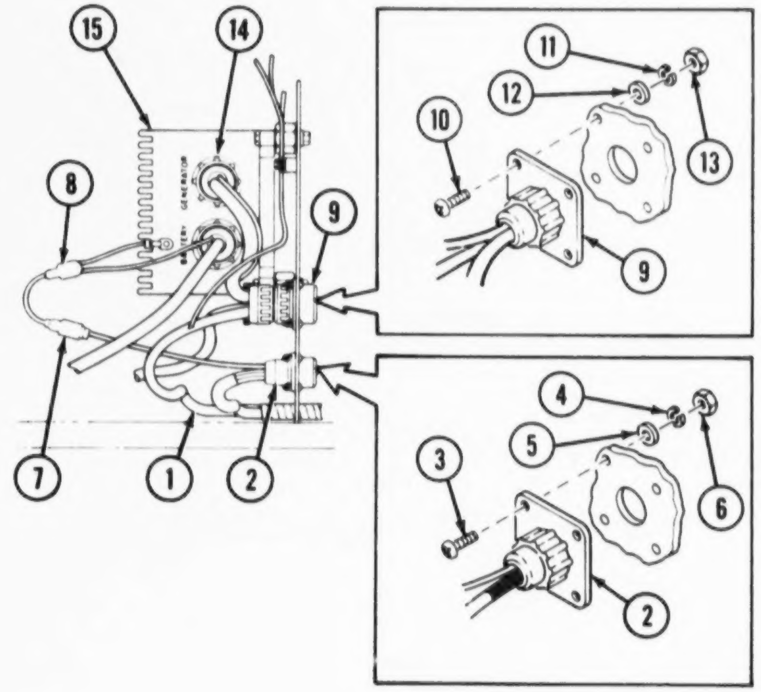
REMO AL

A D connect harness (1), APU electrical disconnect (2) and re ove receptacle from APU bulkhead by removing four screws (3 four lockwashers (4), four flat washers (5) and four nuts (6). D card lockwashers.

B D connect harness connector (7) from harness 12330256 re ulator ground circuit (8).

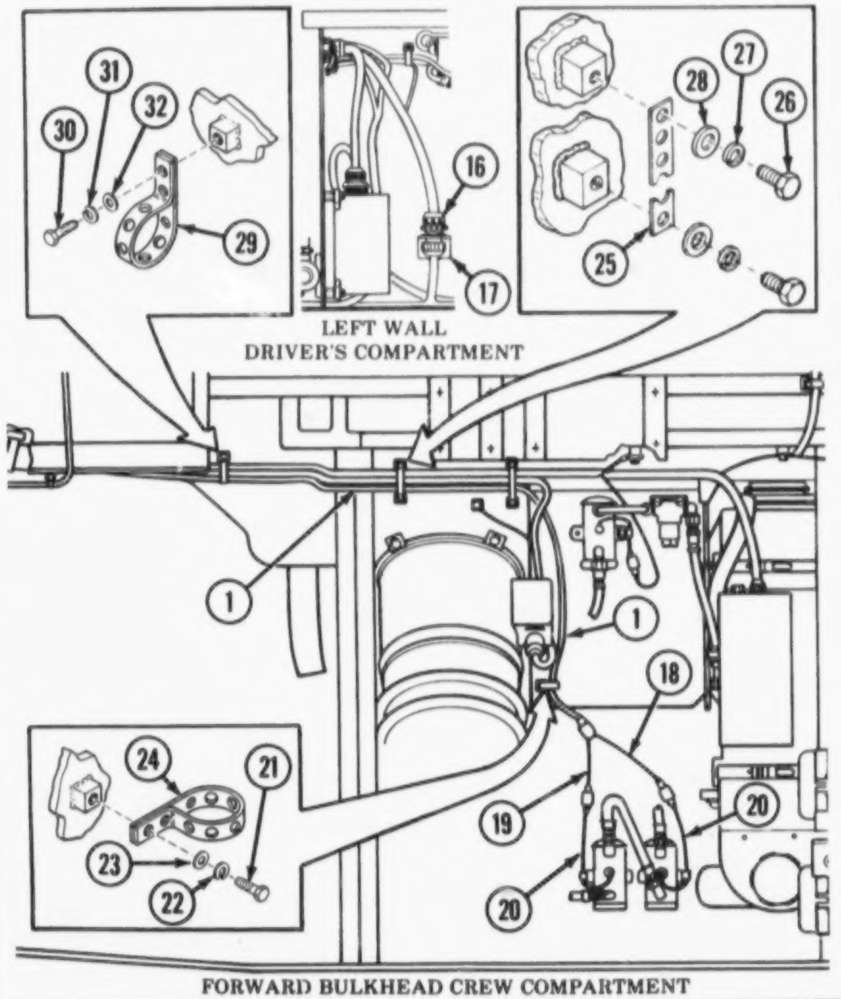
C D connect APU electrical disconnect and remove receptacle (9) rom APU bulkhead by removing four screws (10), four lo washers (11), four flat washers (12) and four nuts (13). Di ard lockwashers.

D Di onnect APU voltage regulator generator plug (14) from A J voltage regulator (15).



TA57271

APU CONTROL BOX TO APU VOLTAGE REGULATOR WIRING HARNESS (12330248): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


31
30
32
29
16
17
28
27
26
25
LEFT WALL
DRIVER'S COMPARTMENT
1
1
18
24
21
23
22
19
20
20
FORWARD BULKHEAD CREW COMPARTMENT

E Disconnect APU power feed plug (16) from harness 12330257 receptacle (17).

F Disconnect harness APU fuel pump connectors (18 and 19) from APU fuel pump leads (20).

G Remove screw (21), lockwasher (22), flat washer (23) and retaining strap (24). Reinstall retaining strap.

H Remove from each of two retaining strap assemblies (25) one screw (26), one lockwasher (27) and one flat washer (28). Remove harness (1).

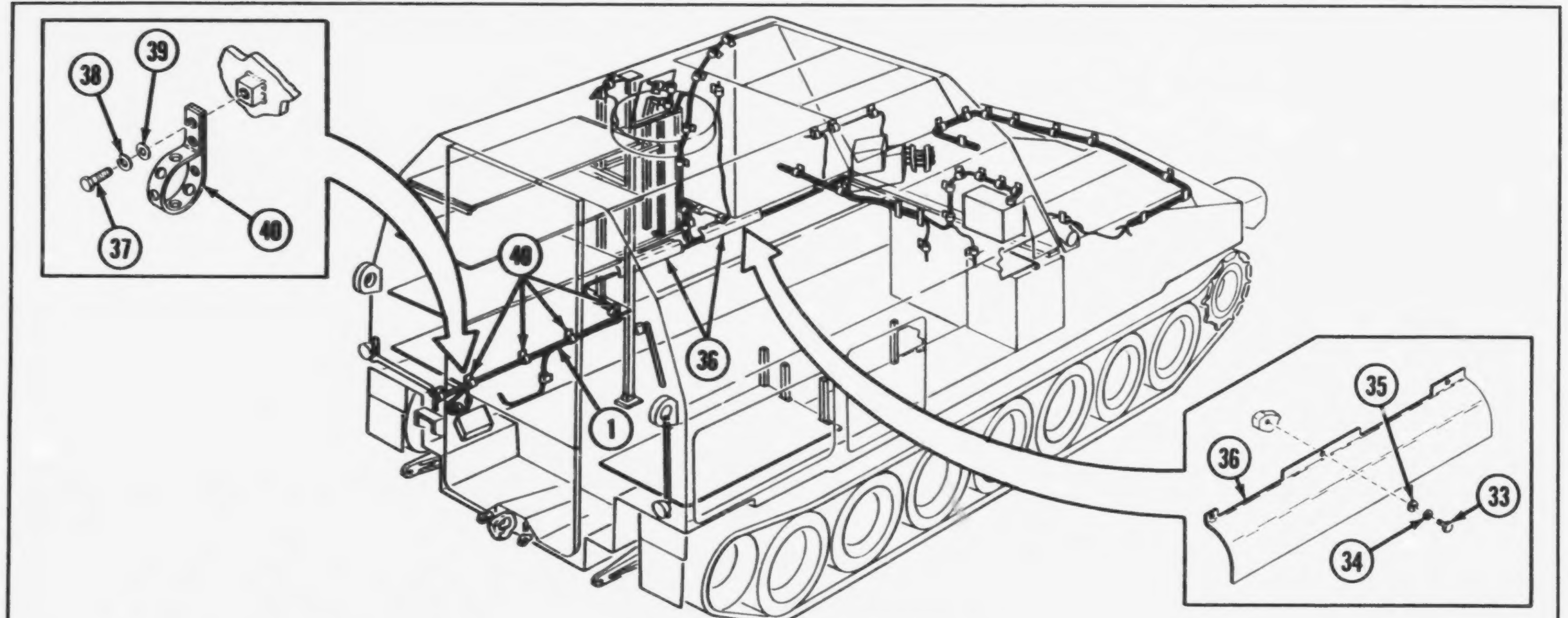
NOTE

Do not remove other harnesses from strap assemblies. Reinstall attaching hardware.

I Remove from each of two strap assemblies (29) on screw (30), lockwasher (31) and flat washer (32). Remove harness and reinstall strap assemblies.

TA57208

APU CONTROL BOX TO APU VOLTAGE REGULATOR WIRING HARNESS (12330248): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



J Remove seven screws (33), seven lockwashers (34), seven flat washers (35) and two harness guards (36). Discard lockwashers.

K Remove four screws (37), four lockwashers (38), four flat washers (39) and four harness retaining strap (40). Remove harness (1) only. Reinstall strap and hardware.

L Remove APU control box (p 13-35).

M Remove harness (1) from vehicle.

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

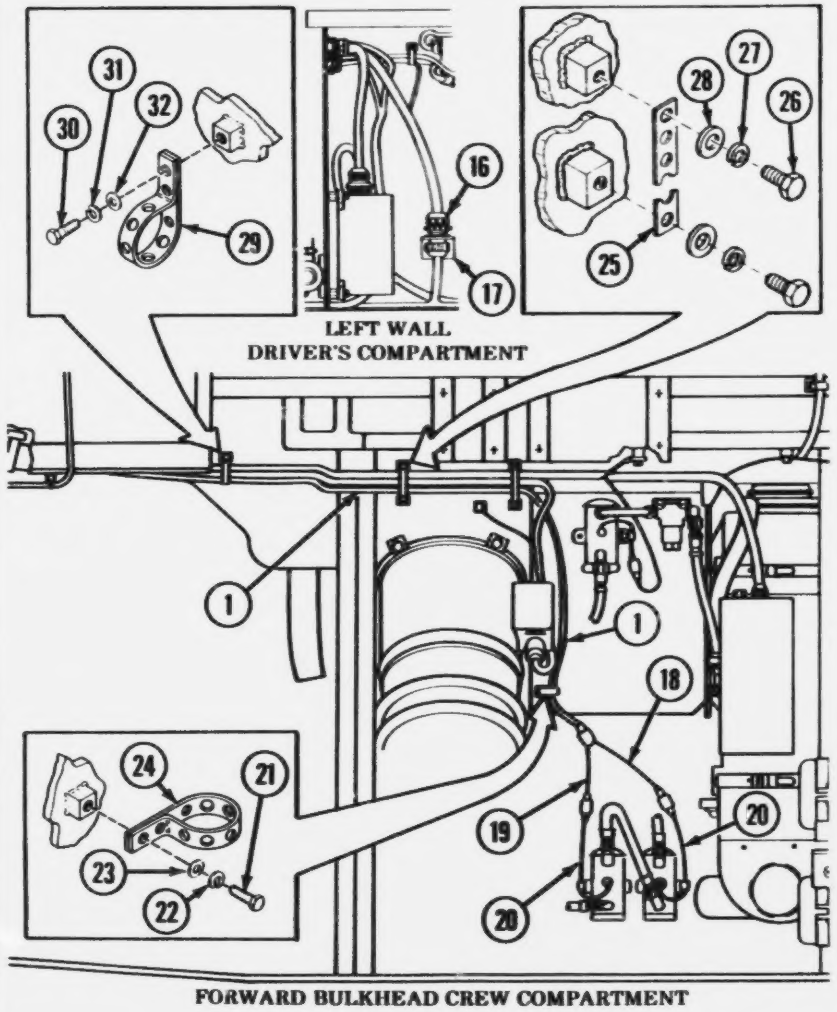
A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

TA57209

APU CONTROL BOX TO APU VOLTAGE REGULATOR WIRING HARNESS (12330248): REMOVAL DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


31
32
30
29
16
17
27
28
26
25
LEFT WALL
DRIVER'S COMPARTMENT
1
1
18
24
21
23
22
19
20
20
FORWARD BULKHEAD CREW COMPARTMENT

ASSEMBLY

A Reassemble wiring branches.

B Regroup wiring branches and secure with electrical tape (item 60, Appx D).

INSTALLATION

A Install harness (1) to vehicle.

B Install APU control box (p 13-35).

C Install four retaining straps (40), four flat washers (39), four lockwashers (34) and seven screws (33).

D Install two harness guards (36), seven flat washers (35), seven new lockwashers (34) and seven screws (33).

E Install one flat washer (32), lockwasher (31) and screw (30) on each of two retaining strap assemblies (29).

F Install harness (1) with flatwasher (28), new lockwasher (27) and screw (26) on each of two retaining strap assemblies (25).

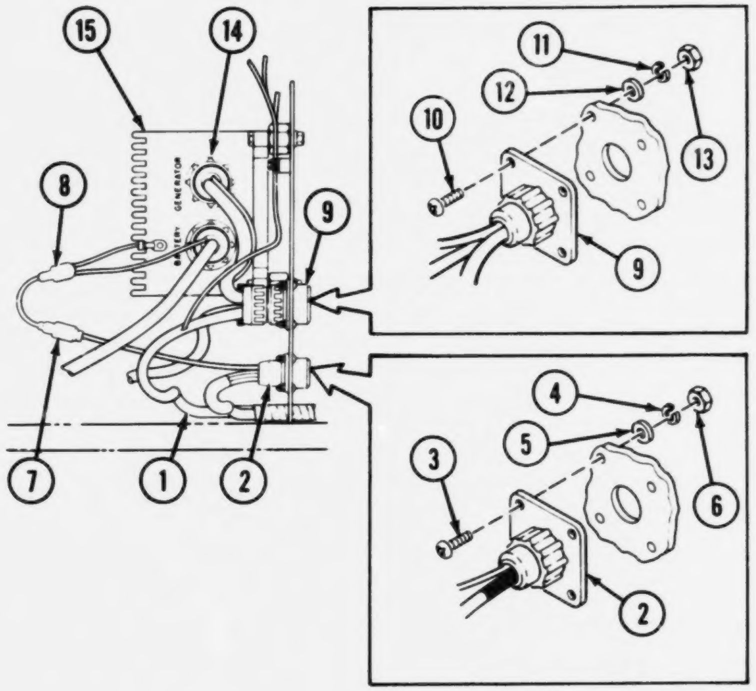
G Install retaining strap (24), flat washer (23), lockwasher (22) and screw (21).

H Connect APU fuel pump connectors (18 and 19) to APU fuel pump leads (20).

I Connect APU power feed plug (16) to harness 12330257 receptacle (17).

TA57210

APU CONTROL BOX TO APU VOLTAGE REGULATOR WIRING HARNESS (12330248): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



J Connect APU voltage regulator generator plug (14) to APU voltage regulator (15).

K Install four nuts (13), four flat washers (12), four new lockwashers (11), four screws (10) and receptacle (9) to APU bulkhead. Connect receptacle (9) to APU electrical disconnect.

L Connect harness connector (7) to harness 12330256 regulator ground circuit (8).

M Install four nuts (6), four flat washers (5), four new lockwashers (4), four screws (3) and APU electrical disconnect (2) to APU bulkhead. Connect APU electrical connector (2) to harness (1).

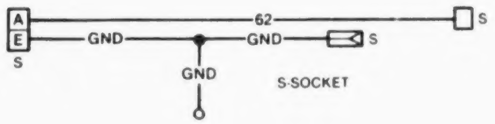
TA57211

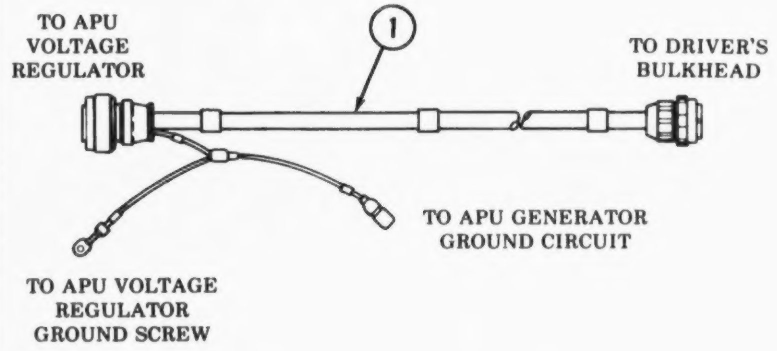
DRIVER'S BULKHEAD TO APU VOLTAGE REGULATOR CABLE (12330256): REMOVAL AND INSTALLATION

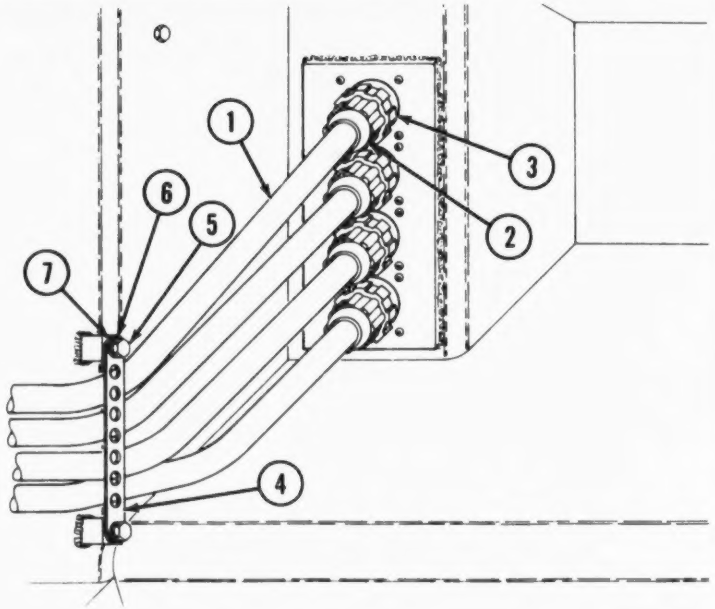
INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.


A
E
S
GND
62
GND
S
S
GND
S-SOCKET


1
TO APU VOLTAGE REGULATOR
TO DRIVER'S BULKHEAD
TO APU GENERATOR GROUND CIRCUIT
TO APU VOLTAGE REGULATOR GROUND SCREW



REMOVAL

A Disconnect cable (1) plug (2) from driver's bulkhead receptacle (3).

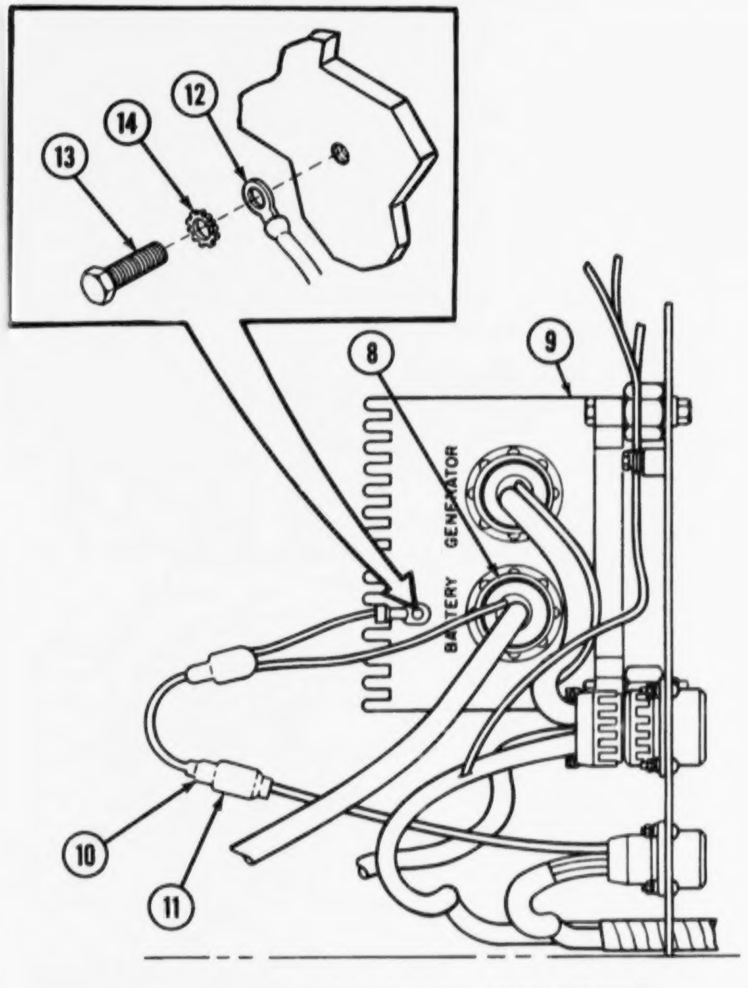
NOTE

Do not remove other harnesses from straps. Replace hardware after removal.

B Remove cable (1) from two retaining straps (4) by removing from one end only, one screw (5), lockwasher (6) and flat washer (7).

TA57615

DRIVER'S BULKHEAD TO APU VOLTAGE REGULATOR CABLE (12330256): REMOVAL AND INSTALLATION (CONTINUED)



LEFT WALL DRIVER'S COMPARTMENT

C Disconnect cable plug (8) from APU voltage regulator (9).

D Disconnect lead connector (10) from harness 12330248 lead (11).

E Remove cable ground lug (12) from APU voltage regulator (9) by removing screw (13) and lockwasher (14). Discard lockwasher.

INSTALLATION

A Install cable ground lug (12) to APU voltage regulator (9) by installing screw (13) and new lockwasher (14).

B Connect lead connector (10) to harness 12330248 lead (11).

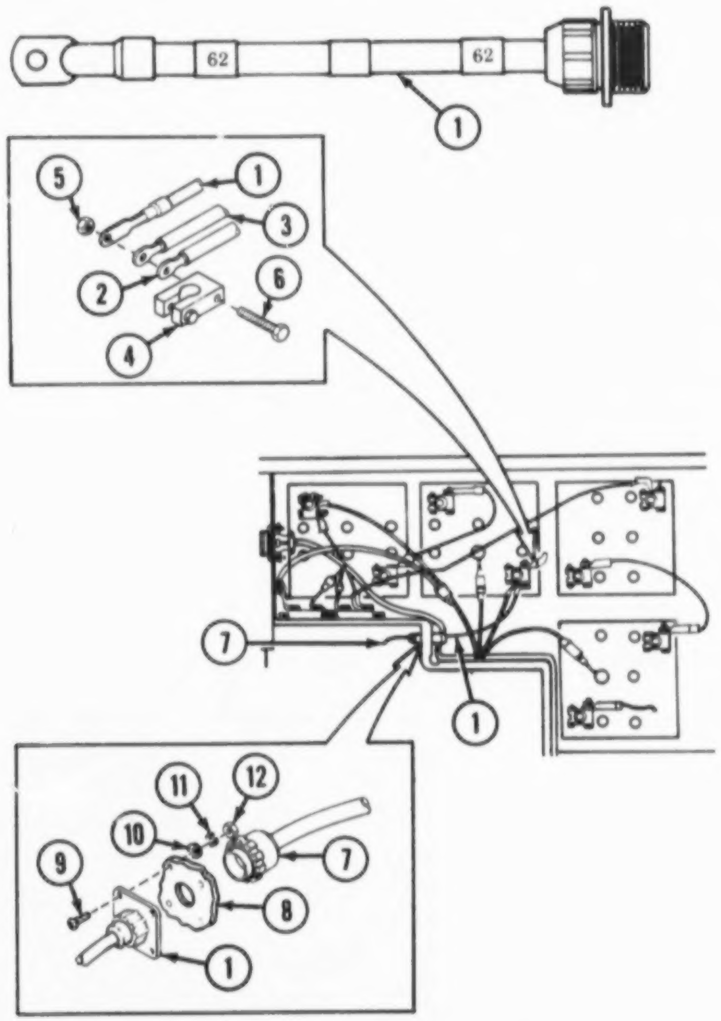
C Connect cable plug (8) to APU voltage regulator (9).

D Install cable (1) with two retaining straps (4) by installing screw (5), lockwasher (6) and flat washer (7).

E Connect cable (1) plug (2) to driver's bulkhead receptacle (3).

TA57616

BATTERY TO DRIVER'S BULKHEAD CABLE (12330317): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Wear eye protection and remove all jewelry, dog tags and metal items. Turn OFF MASTER switch. Remove battery ground cables.

A Disconnect cable (1) and STE/ICE leads 10R (2) and 10V (3) at battery terminal (4) by removing terminal nut (5) and screw (6).

B Disconnect harness 12330256 plug (7) from receptacle of cable (1) at driver's side of bulkhead (8).

C Remove cable (1) receptacle at driver's compartment bulkhead by removing four screws (9), four flat washers (10), four lockwashers (11) and four nuts (12).

INSTALLATION

Reverse removal procedures.

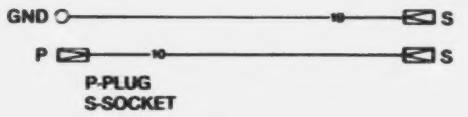
TA311151

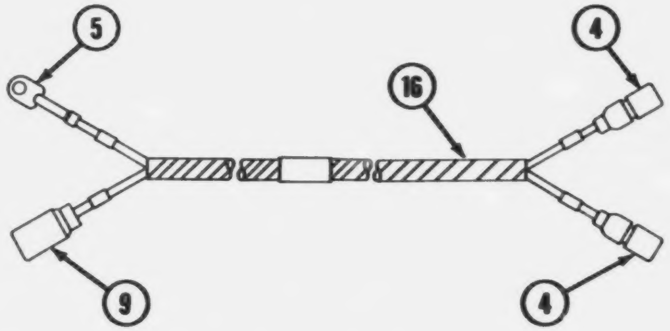
CONVEYOR CONTROL SWITCH TO CONVEYOR OVERRIDE SAFETY SWITCH WIRING HARNESS (12330244): REMOVAL AND INSTALLATION

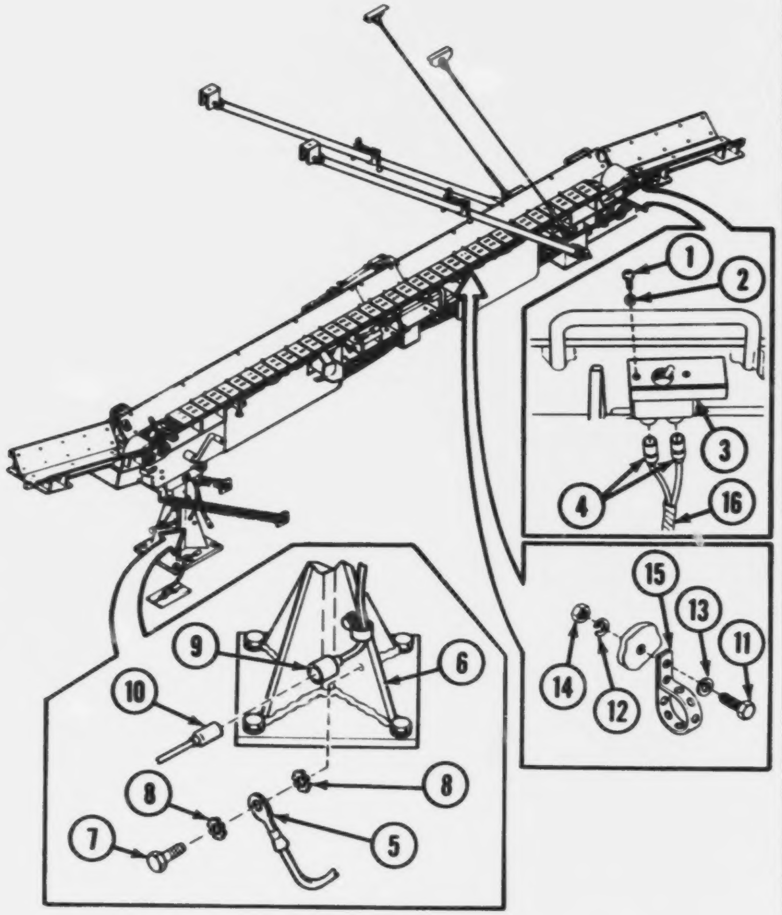
INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (p 6-44).
MASTER switch OFF.


GND
10
S
P
10
S
P-PLUG
S-SOCKET




1
2
3
4
16
15
13
11
14
12
9
6
10
8
8
7
5

TA57617

CONVEYOR CONTROL SWITCH TO CONVEYOR OVERRIDE SAFETY SWITCH WIRING HARNESS (12330244): REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

Tag wiring harness lead connector location before removal.

A Remove two screws (1) and two lockwashers (2) and remove conveyor override switch (3). Discard lockwashers.

B Disconnect harness connectors (4) from conveyor override switch (3).

C Disconnect ground lead (5) from conveyor pedestal (6) by removing screw (7) and two lockwashers (8). Discard lockwashers.

D Disconnect connector (9) from 12330252 harness connector (10).

E Remove 13 screws (11), 13 lockwashers (12), 13 flat washers (13), four nuts (14) and 13 straps (15) that secure harness (16) to conveyor. Discard lockwashers.

F Remove harness (16) from conveyor.

INSTALLATION

A Install harness (16) to conveyor with 13 straps (15), four nuts (14), 13 flat washers (13), 13 new lockwashers (12) and 13 screws (11).

B Connect connector (9) to 12330252 harness connector (10).

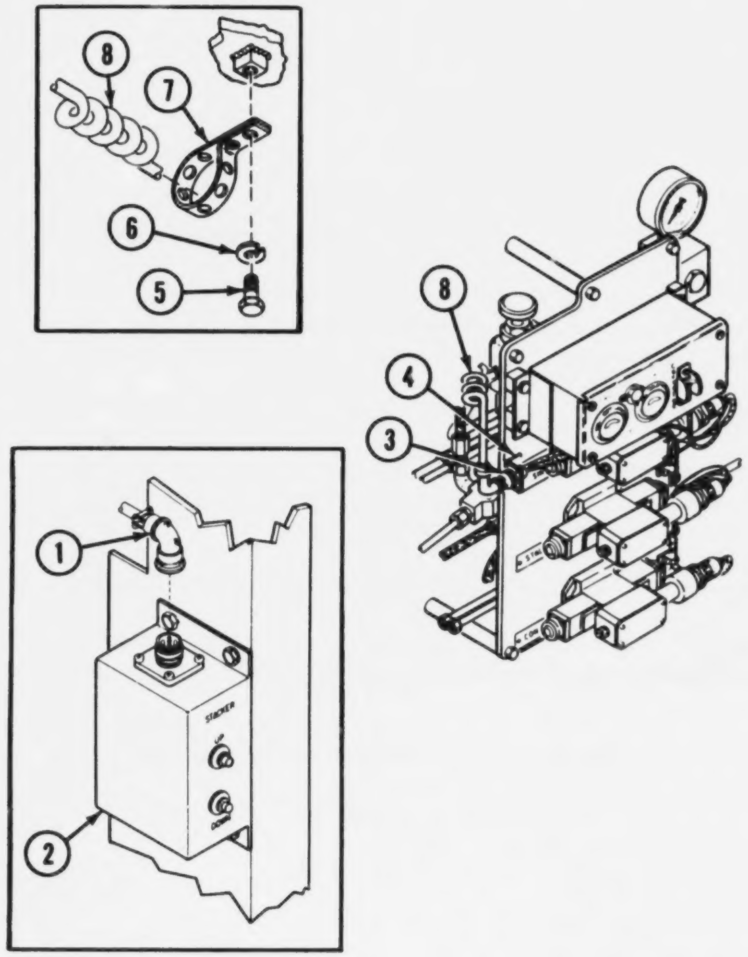
C Connect ground lead (5) to conveyor pedestal (6) with screw (7) and two new lockwashers (8).

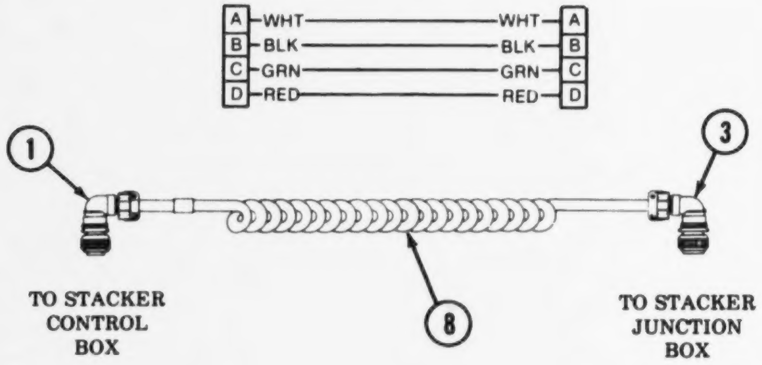
D Connect harness connectors (4) to conveyor override switch (3).

E Install conveyor override switch (3) with two screws (1) and two new lockwashers (2).

TA57462

STACKER CONTROL SWITCH CABLE (12330259): REMOVAL AND INSTALLATION


8
7
6
5
8
4
3
1
2
STACKER


A WHT WHT A
B BLK BLK B
C GRN GRN C
D RED RED D
1
3
8
TO STACKER CONTROL BOX
TO STACKER JUNCTION BOX

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect cable plug (1) from stacker control switch (2).

B Disconnect cable plug (3) from harness receptacle (4).

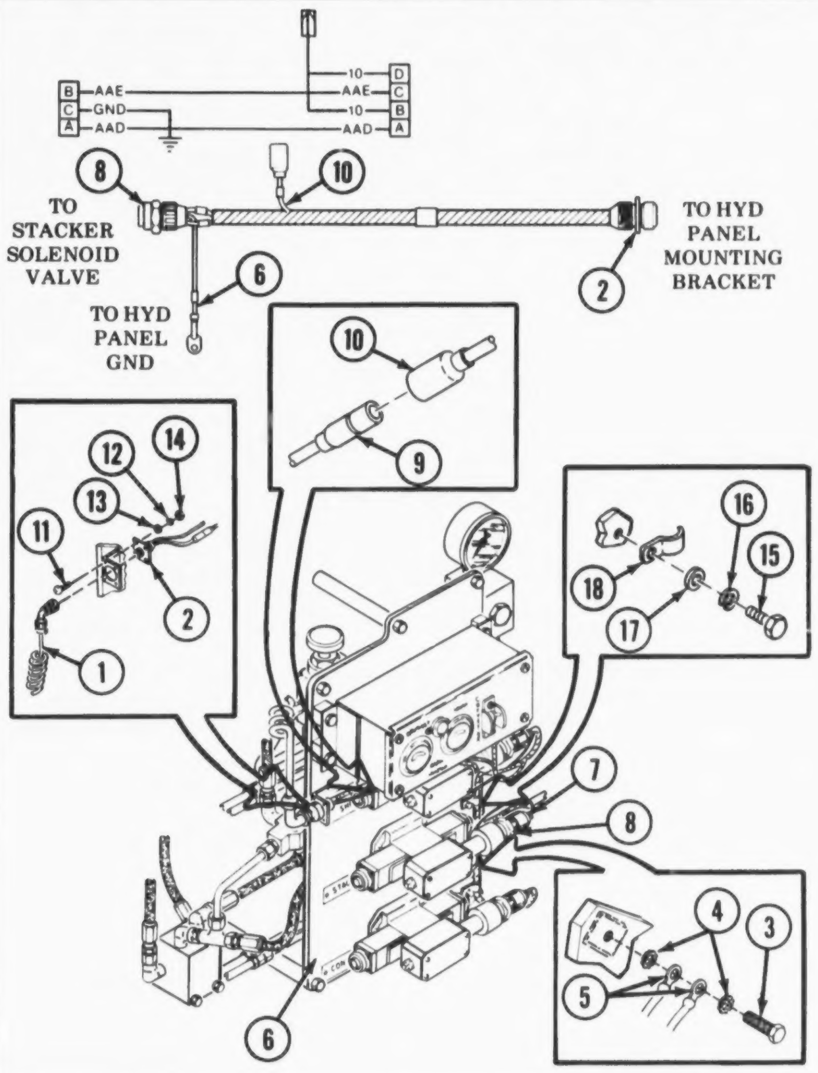
C Remove screw (5), lockwasher (6) and strap (7) located on upper left ceiling between canister rack and hydraulic panel. Remove cable (8) from vehicle.

INSTALLATION

Reverse removal procedures.

TA57212

STACKER SOLENOID VALVE WIRING HARNESS (12332677-1): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


B AAE
C GND
A AAD
10 D
AAE C
10 B
AAD A
8
10
TO STACKER SOLENOID VALVE
6
TO HYD PANEL GND
2
TO HYD PANEL MOUNTING BRACKET
10
9
12
14
13
11
2
1
16
15
18
17
7
8
4
3
5
6

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect cable 12330259 plug (1) from receptacle (2).

B Remove screw (3), two lockwashers (4) and disconnect GND wires (5) from hydraulic panel (6).

C Disconnect harness plug (7) from stacker solenoid (8).

D Disconnect circuit 10 connector (9) from 12330252 cable connector (10).

E Remove four screws (11), four lockwashers (12), four flat washers (13), four nuts (14) and remove receptacle (2) and harness from hydraulic panel.

F Remove screw (15), lockwasher (16) and flat washer (17) from strap (18).

TA311154

STACKER SOLENOID VALVE WIRING HARNESS (12332677-1): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

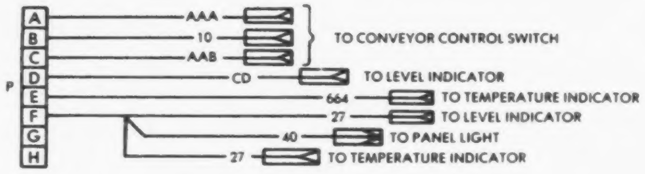
TA311155

HYDRAULIC GAGE PANEL WIRING HARNESS (12333555): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

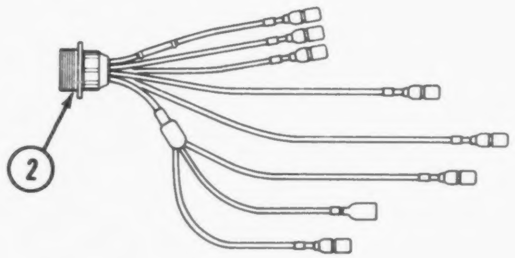
INITIAL SETUP

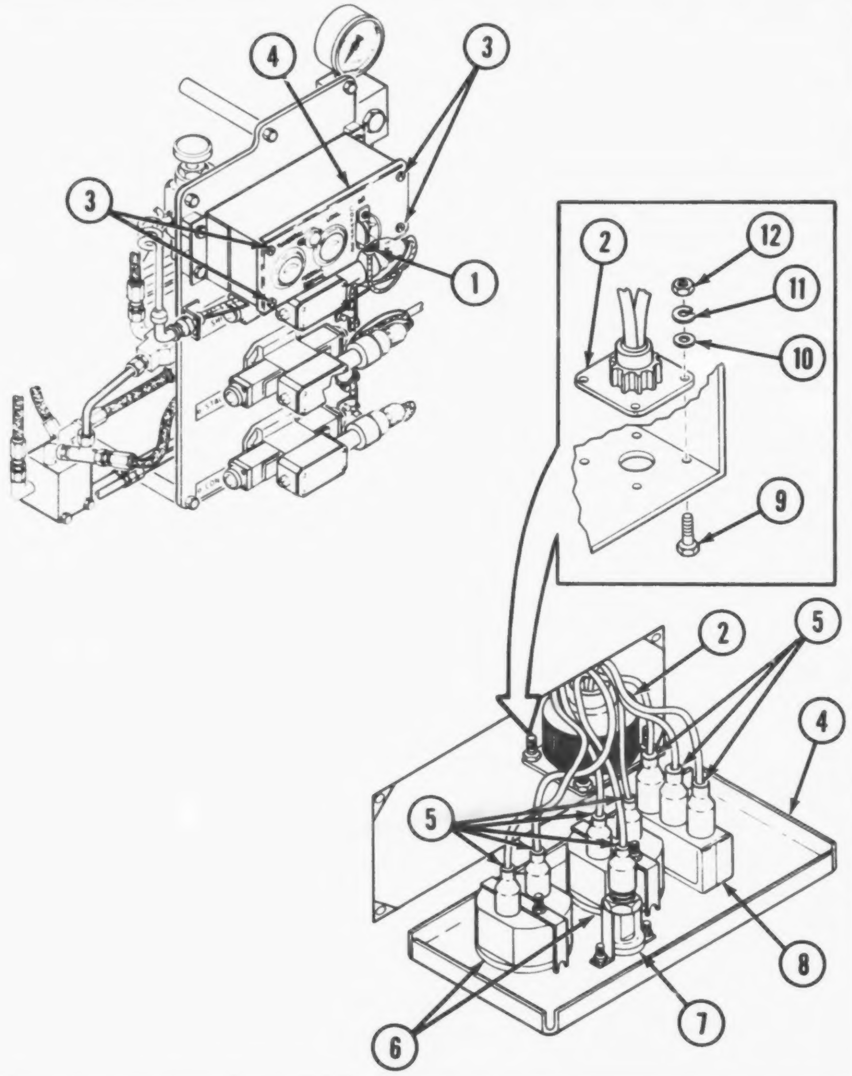
Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.


A
B
C
D
E
F
G
H
P
AAA
10
AAB
TO CONVEYOR CONTROL SWITCH
CD
TO LEVEL INDICATOR
664
TO TEMPERATURE INDICATOR
27
TO LEVEL INDICATOR
40
TO PANEL LIGHT
27
TO TEMPERATURE INDICATOR

P = PLUG




4
3
3
1
2
12
11
10
9
2
5
4
5
8
6
7

TA57463

HYDRAULIC GAGE PANEL WIRING HARNESS (12333555): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

A Disconnect wiring harness plug (1) from gage panel receptacle (2).

B Turn four retaining studs (3) and open cover (4).

C Remove eight harness connectors (5) from gages (6), light (7) and conveyor control switch (8).

D Remove four screws (9), four flat washers (10), four lockwashers (11) and four nuts (12). Discard lockwashers.

E Remove receptacle (2) and attached wires from gage panel assembly.

DISASSEMBLY

Disassemble and replace defective wires (p 2-307).

ASSEMBLY

Reassemble and regroup wires.

INSTALLATION

A Install receptacle (2) and attached wires to gage panel assembly.

B Install four screws (9), four flat washers (10), four new lockwashers (11) and four nuts (12).

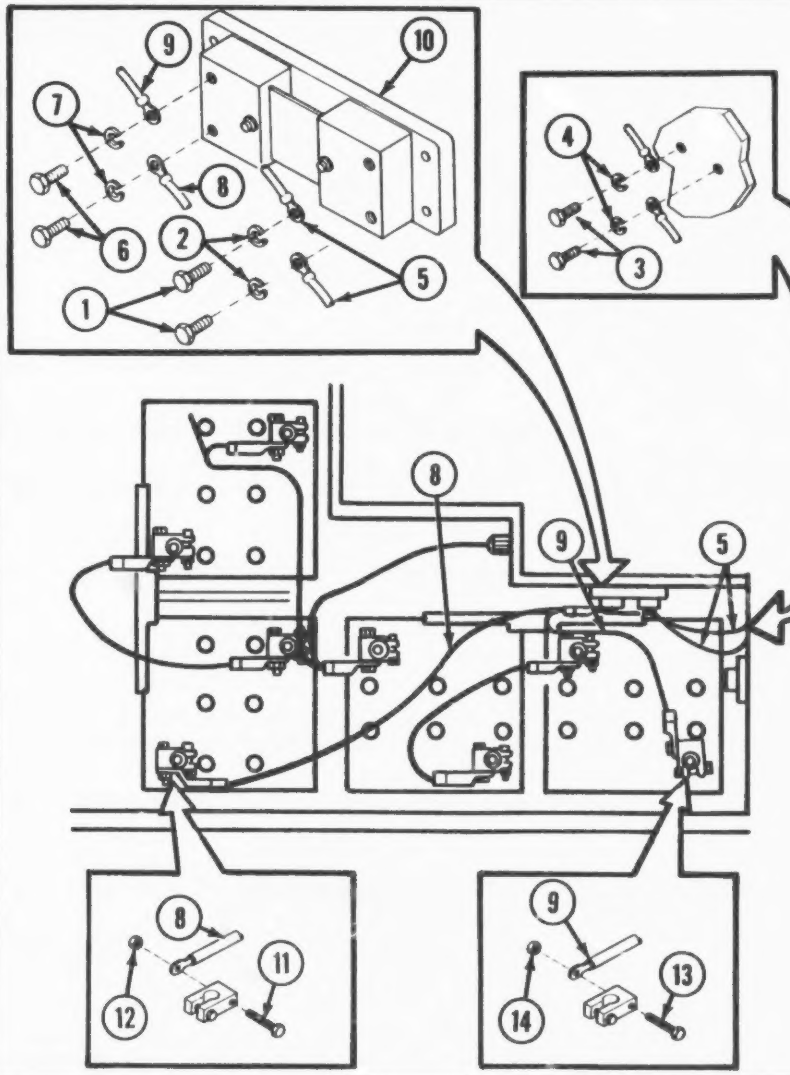
C Install eight harness connectors (5) to gages (6), light (7) and conveyor control switch (8).

D Close cover (4) and turn four retaining studs (3).

E Connect wiring harness plug (1) to gage panel receptacle (2).

TA57464

BATTERY CABLES (10897992, 10897993, 12330348): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables. Wear eye protection; remove all jewelry, dog tags and metal items.

CAUTION

When removing battery cables, always remove ground cables first.

A Remove two screws (1), two lockwashers (2), two screws (3) and two lockwashers (4).

B Remove two 10897992 cables (5) from battery compartment.

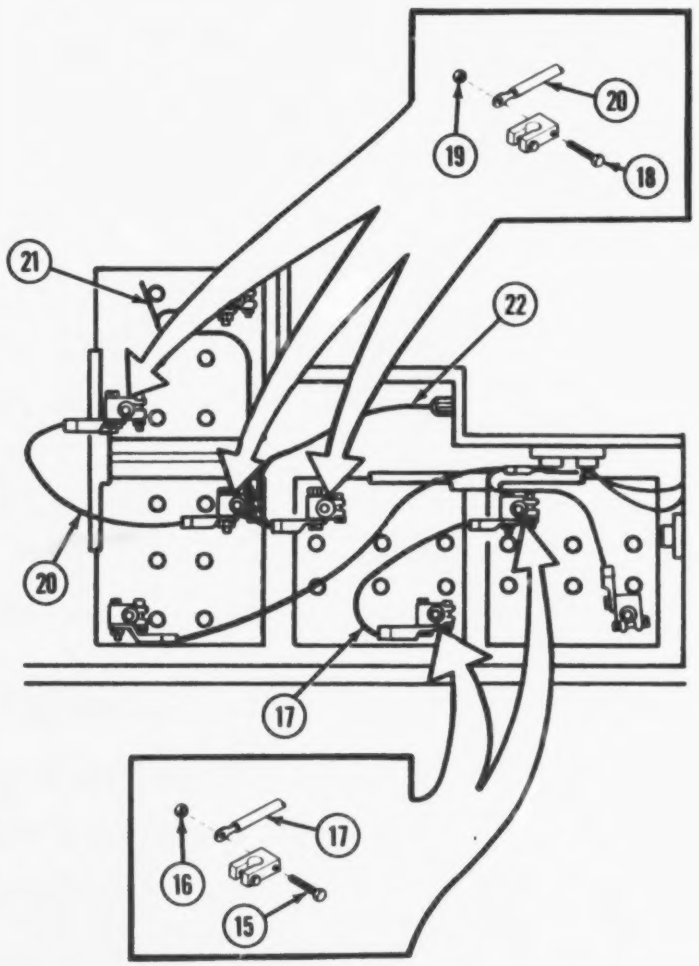
C Remove two screws (6), two lockwashers (7) and disconnect two cables (8 and 9) from shunt (10).

D Remove screw (11), nut (12) and remove cable 12330348 (8) from vehicle.

E Remove screw (13), nut (14) and remove cable 10897992 (9) from vehicle.

TA311157

BATTERY CABLES (10897992, 10897993, 12330348): REMOVAL AND INSTALLATION (CONTINUED)



F Remove two screws (15), two nuts (16) and cable 10897993 (17).

G Remove two screws (18), two nuts (19) and cable 10897993 (20).

H Remove cable 12668100 (21) (p 6-68).

I Remove cable 12330317 (22) (p 6-120).

INSTALLATION

Reverse removal procedures.

TA311158

TRAILER RECEPTACLE WIRING HARNESS (12330246): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

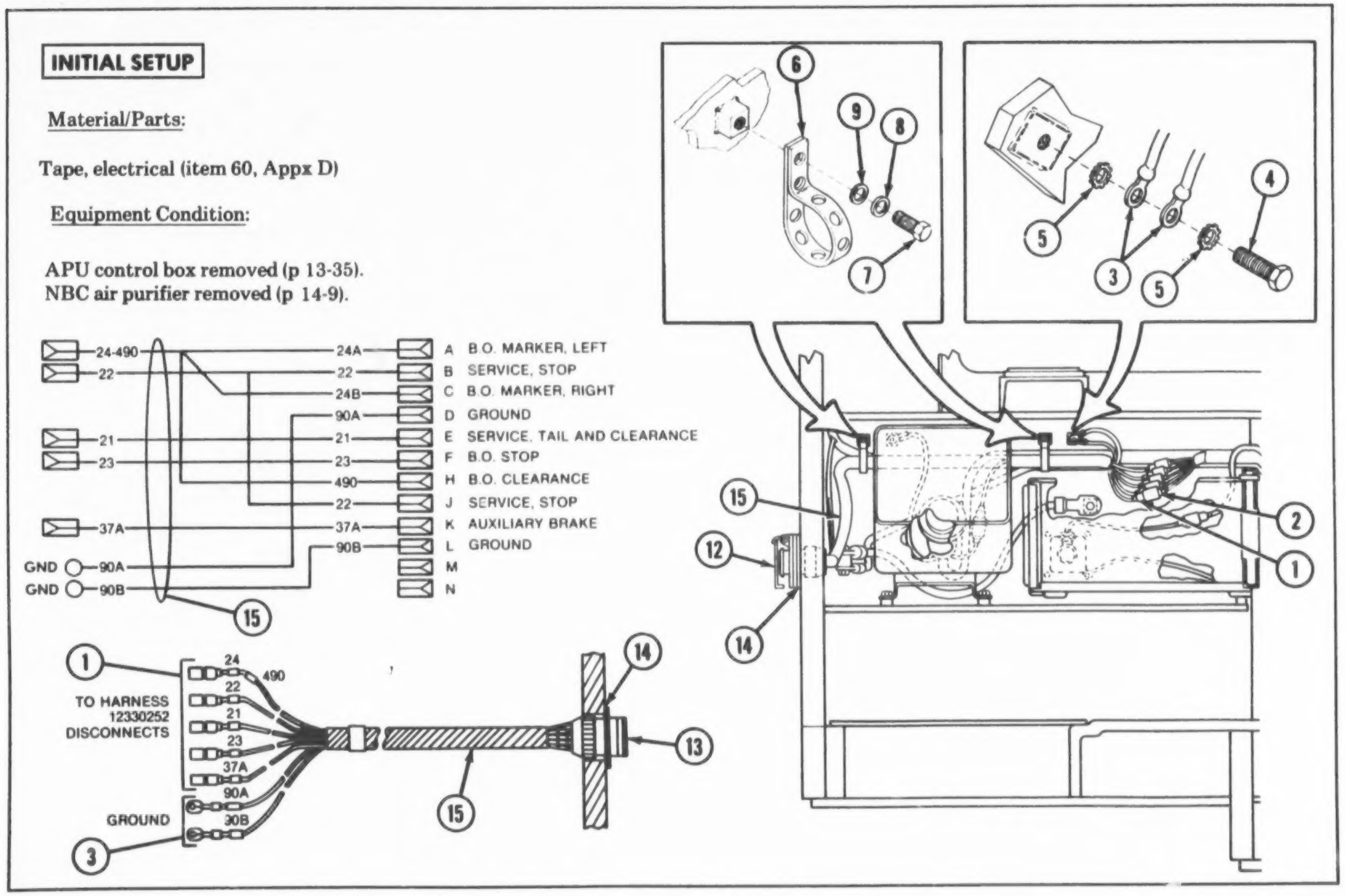
INITIAL SETUP

Material/Parts:

Tape, electrical (item 60, Appx D)

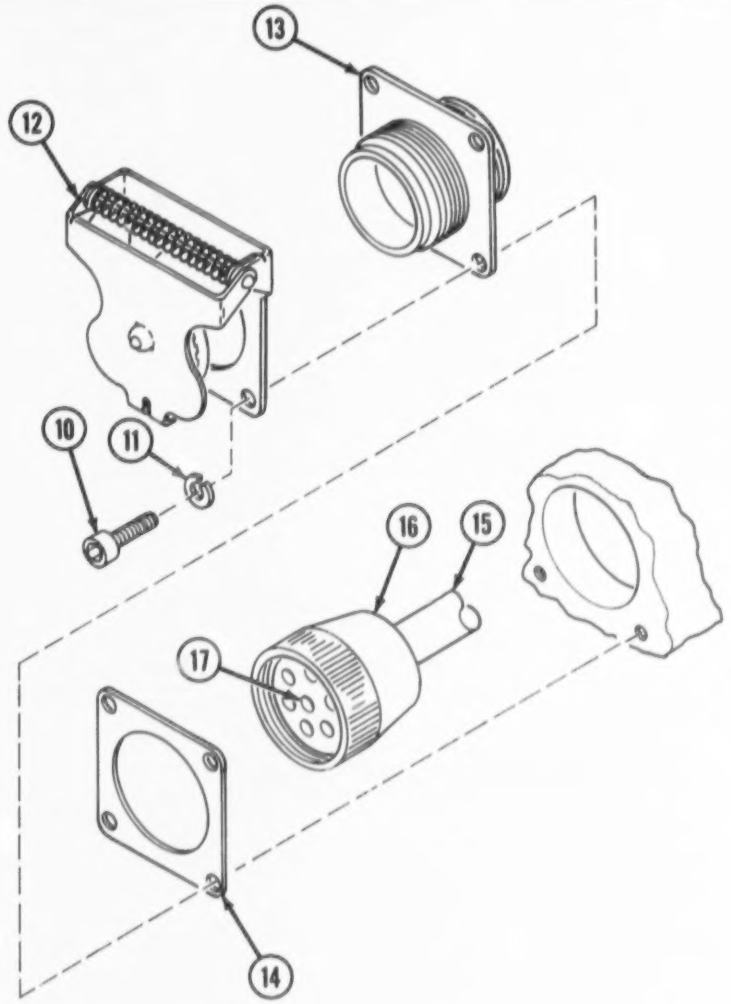
Equipment Condition:

APU control box removed (p 13-35).
NBC air purifier removed (p 14-9).


24-490
22
21
23
37A
GND 90A
GND 90B
24A A B.O. MARKER, LEFT
22 B SERVICE, STOP
24B C B.O. MARKER, RIGHT
90A D GROUND
21 E SERVICE, TAIL AND CLEARANCE
23 F B.O. STOP
490 H B.O. CLEARANCE
22 J SERVICE, STOP
37A K AUXILIARY BRAKE
90B L GROUND
M
N
15
1
TO HARNESS 12330252 DISCONNECTS
24
490
22
21
23
37A
90A
30B
GROUND
3
15
14
13
6
9
8
7
4
5
3
5
15
12
14
2
1

TA312817

TRAILER RECEPTACLE WIRING HARNESS (12330246): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground cables.

A Open and secure battery compartment doors.

B Disconnect five connectors (1) from harness 12330252 connectors (2).

C Disconnect two wiring harness ground lugs (3) from vehicle mounting studs by removing screw (4) and two lockwashers (5). Discard lockwashers.

D Remove two harness straps (6) by removing from each one screw (7), lockwasher (8) and flat washer (9). Discard lockwashers.

NOTE

Do not remove other harnesses from straps. Reinstall hardware after harness removal.

E Remove four screws (10), four lockwashers (11) and receptacle cover (12). Discard lockwashers.

F Pull receptacle (13) and gasket (14) with wiring harness (15) attached from rear of vehicle.

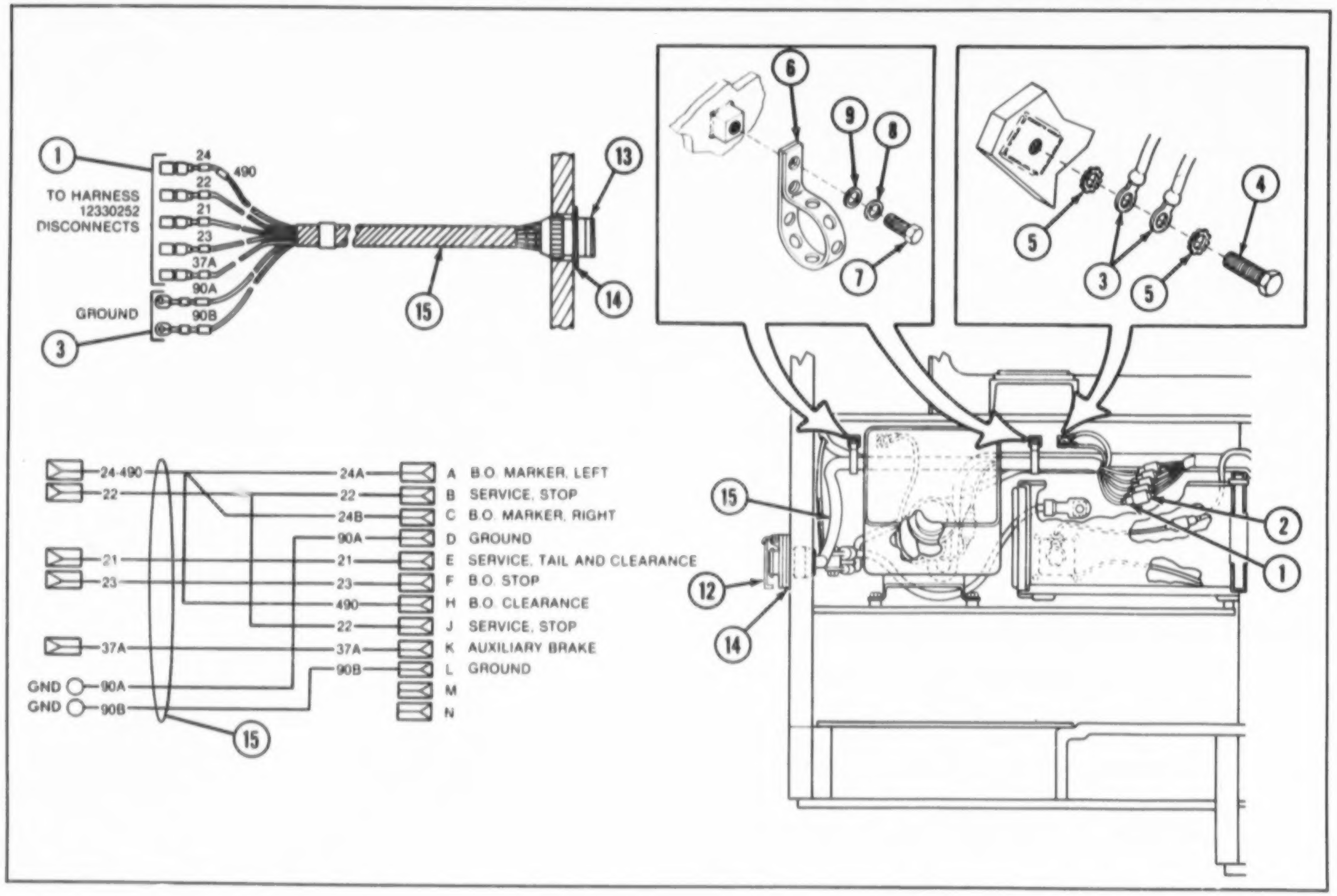
G Unscrew cap (16) from receptacle (13) and slide back on wiring harness (15).

H Pull grommet (17) from receptacle (13).

I Remove receptacle (13) and gasket (14). Discard gasket.

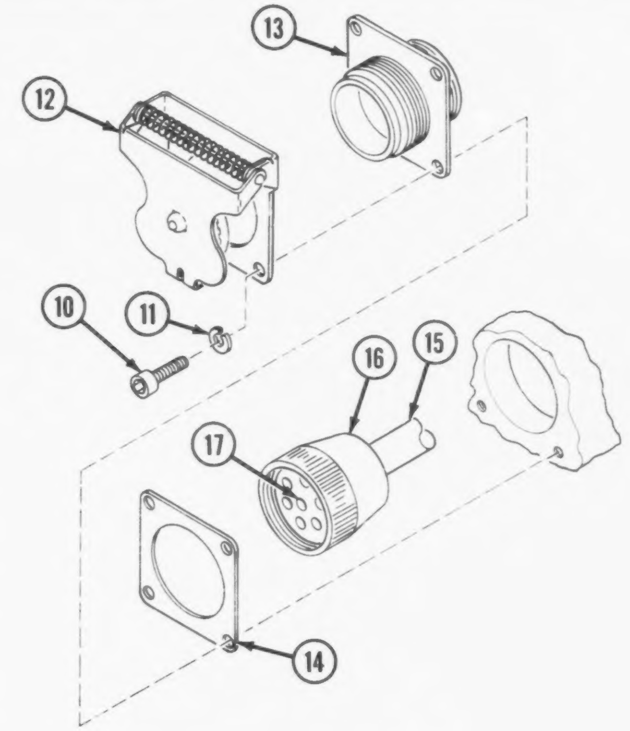
TA312818

TRAILER RECEPTACLE WIRING HARNESS (12330246): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


①
24
490
22
TO HARNESS
12330252
DISCONNECTS
21
23
37A
90A
GROUND
90B
③
⑮
⑬
⑭
⑥
⑨
⑧
⑦
④
⑤
③
⑤
24-490
22
21
23
37A
GND
90A
GND
90B
⑮
24A
22
24B
90A
21
23
490
22
37A
90B
A B.O. MARKER, LEFT
B SERVICE, STOP
C B.O. MARKER, RIGHT
D GROUND
E SERVICE, TAIL AND CLEARANCE
F B.O. STOP
H B.O. CLEARANCE
J SERVICE, STOP
K AUXILIARY BRAKE
L GROUND
M
N
⑮
⑫
⑭
②
①

TA312819

TRAILER RECEPTACLE, WIRING HARNESS (12330246): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove electrical tape.

B Separate and isolate defective harness wires.

C Repair wires (p 2-307).

ASSEMBLY

Regroup harness wires. Secure with electrical tape (item 60, Appx D).

INSTALLATION

A Install new gasket (14) on receptacle (13).

B Install grommet (17) in receptacle (13).

C Screw cap (16) onto receptacle (13).

D Install receptacle (13) with wiring harness (15).

E Install receptacle cover (12).

F Secure new gasket (14), trailer receptacle (13), and cover (12) to vehicle with four screws (10) and four new lockwashers (11).

G Remove lower upper rear door control switch (p 6-61).

H Install two harness straps (6) with two screws (7), two new lockwashers (8) and two flat washers (9).

I Install lower upper rear door control switch (p 6-61).

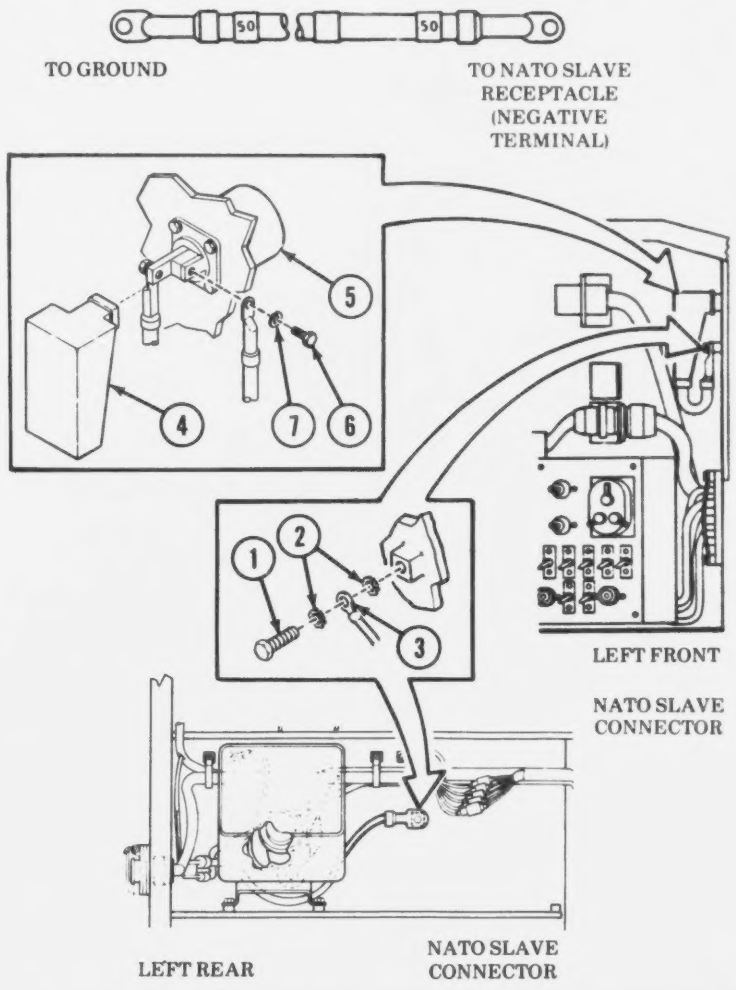
J Connect two wiring harness ground lugs (3) to vehicle mounting studs with screw(4) and two new lockwashers (5).

K Connect five connectors (1) to harness 12330252 connectors (2).

L Close and secure battery compartment doors.

TA312820

NATO INTERVEHICULAR SLAVE CONNECTOR GROUND CABLE (12332678): REMOVAL AND INSTALLATION


50
50
TO GROUND
TO NATO SLAVE RECEPTACLE (NEGATIVE TERMINAL)
5
4
7
6
1
2
3
LEFT FRONT
NATO SLAVE CONNECTOR
LEFT REAR
NATO SLAVE CONNECTOR

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

Both NATO slave connector ground cables, left front and left rear, are removed and installed in same manner.

A To remove rear slave connector ground cable, remove APU control box (p 13-35) and NBC M2A2 air purifier (p 14-3).

B Remove screw (1) and two lockwashers (2) and disconnect cable 12332678 (3) from bulkhead ground mount.

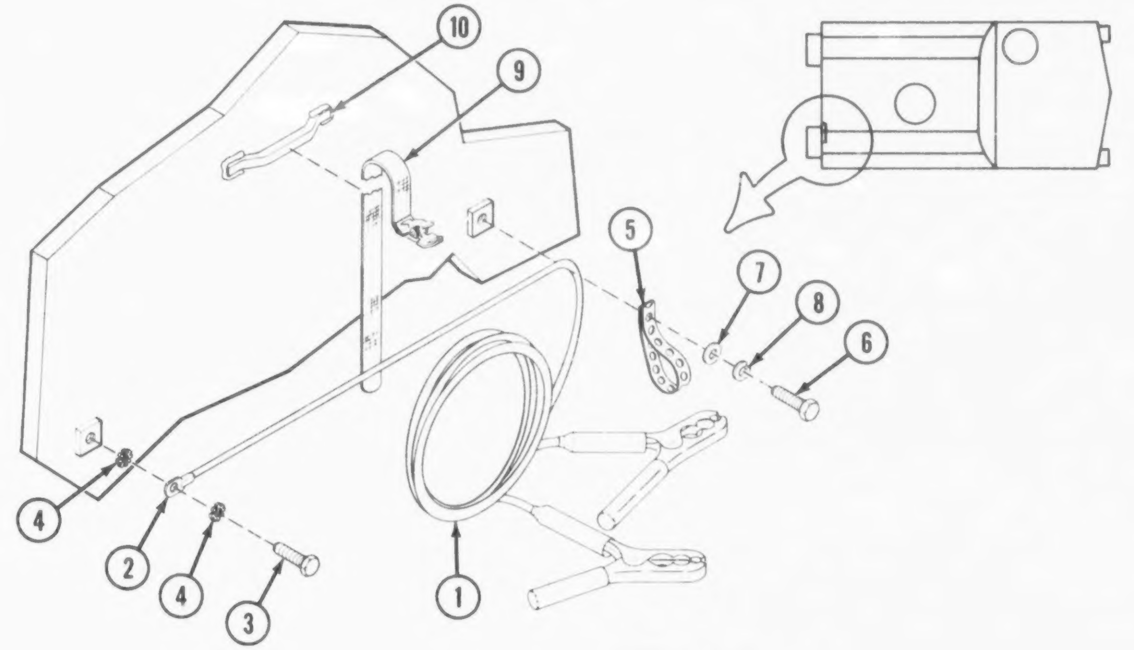
C Pull back rubber boot (4) and disconnect opposite end of cable (3) from NATO slave receptacle (5) by removing screw (6) and lockwasher (7). Remove cable from vehicle.

INSTALLATION

Reverse removal procedures.

TA311161

INTERVEHICULAR GROUNDING CABLE AND STOWAGE STRAPS: REMOVAL AND INSTALLATION



REMOVAL

A Remove cable (1) grounding lug (2) by removing one screw (3) and two lockwashers (4). Discard lockwashers.

B Remove tie-down strap (5) by removing screw (6), flat washer (7) and lockwasher (8). Discard lockwasher.

C Remove cable (1) from vehicle by unstrapping strap assembly (9).

D Remove strap (9) from vehicle-mounted bracket (10).

INSTALLATION

A Install strap (9) on vehicle-mounted bracket (10).

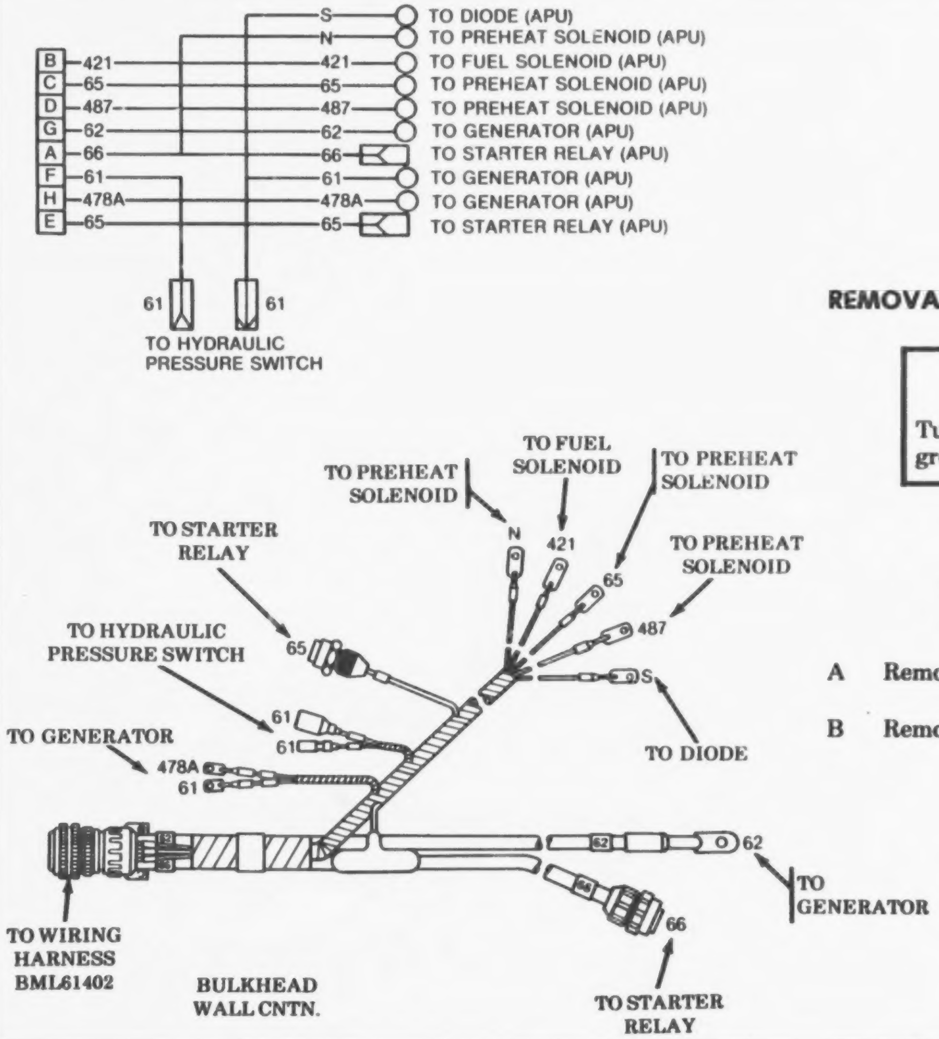
B Install cable (1) in vehicle by securing strap (9).

C Install tie-down strap (5) with screw (6), new lockwasher (8) and flat washer (7).

D Install cable (1) grounding lug (2) with one screw (3) and two new lockwashers (4).

TA312821

APU WIRING HARNESS (12329640): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


B 421
C 65
D 487
G 62
A 66
F 61
H 478A
E 65
S TO DIODE (APU)
N TO PREHEAT SOLENOID (APU)
421 TO FUEL SOLENOID (APU)
65 TO PREHEAT SOLENOID (APU)
487 TO PREHEAT SOLENOID (APU)
62 TO GENERATOR (APU)
66 TO STARTER RELAY (APU)
61 TO GENERATOR (APU)
478A TO GENERATOR (APU)
65 TO STARTER RELAY (APU)
61
61
TO HYDRAULIC PRESSURE SWITCH
TO PREHEAT SOLENOID
TO FUEL SOLENOID
TO PREHEAT SOLENOID
N
421
65
TO PREHEAT SOLENOID
487
TO STARTER RELAY
65
TO HYDRAULIC PRESSURE SWITCH
61
61
S
TO DIODE
TO GENERATOR
478A
61
62
62
TO GENERATOR
66
66
TO WIRING HARNESS BML61402
BULKHEAD WALL CNTN.
TO STARTER RELAY

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

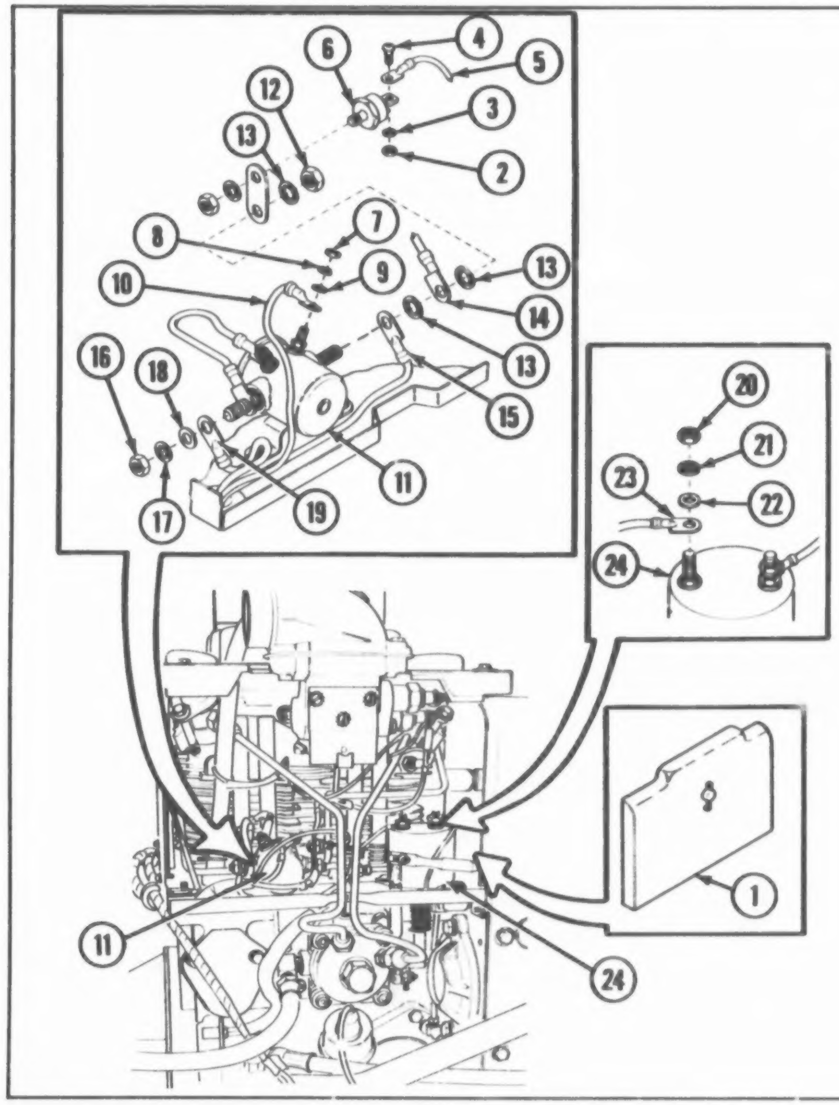
Removal of left projectile rack is required (TM 9-2350-267-10).

A Remove APU access plate (p 13-13).

B Remove air intake plenum (p 13-2).

TA311163

APU WIRING HARNESS (12329640): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



C Remove engine cylinder shroud door panel (1).

D Remove one nut (2), lockwasher (3) and screw (4) securing lead S (5) at diode (6).

E Remove one nut (7), lockwasher (8) and flat washer (9) securing lead 487 (10) at preheat solenoid (11).

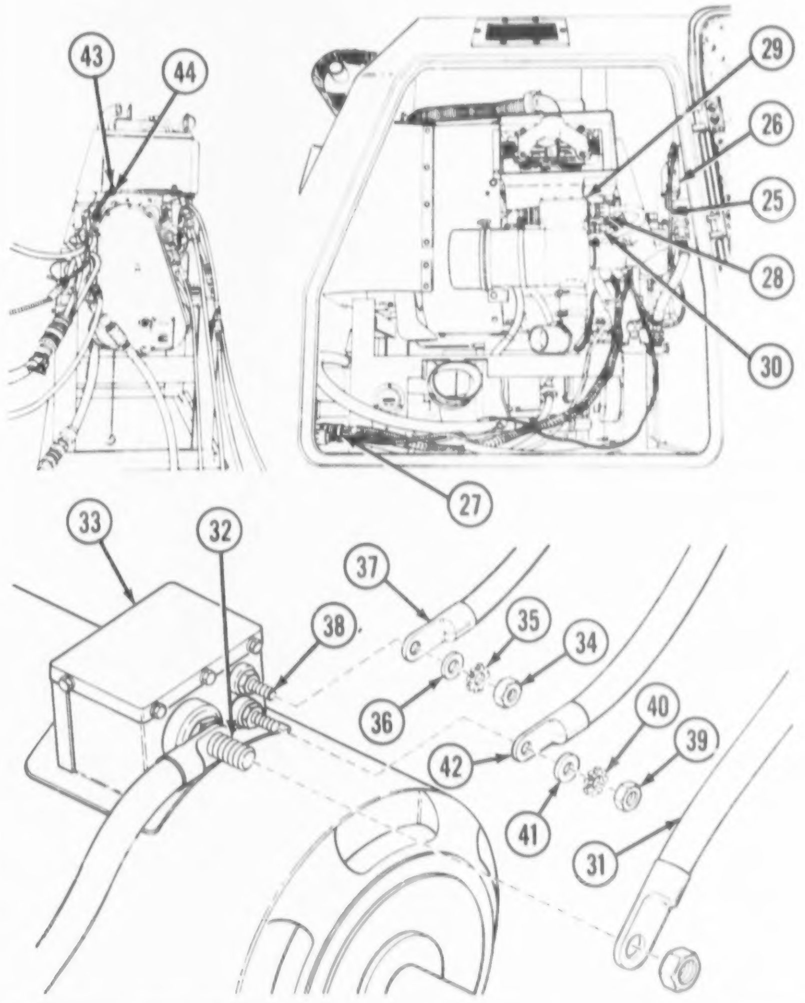
F Remove one nut (12) and three lockwashers (13) securing diode support, circuit R (14) and circuit 65 (15) at preheat solenoid (11).

G Remove one nut (16), lockwasher (17) and flat washer (18) securing lead circuit N (19) at preheat solenoid (11).

H Remove one nut (20), one lockwasher (21) and one flat washer (22) securing lead circuit 421 (23) at fuel shutoff solenoid (24).

TA311164

APU WIRING HARNESS (12329640): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



I Disconnect connectors for two circuits 61 (25) going to hydraulic pressure switch (26) on upper rear bulkhead.

J Disconnect main receptacle 12329640 (27) from vehicle connector at lower left front corner of APU compartment.

K Remove connector circuit 66 (28) from top right side of starter relay (29).

L Remove connector circuit 65 (30) from bottom right side of starter relay (29).

M Remove one nut securing lead 62 (31) at positive terminal B (32) on generator terminal box (33).

N Remove one nut (34), lockwasher (35) and flat washer (36) securing lead 61 (37) to field terminal A (38) on generator terminal box (33).

O Remove one nut (39), lockwasher (40) and flat washer (41) securing lead 478A (42) at interpole terminal D on generator terminal box (33).

P Remove two screws (43) and two clamps (44) securing wiring harness to rear side of APU.

TA311165

APU WIRING HARNESS (12329640): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

Reverse disassembly procedures.

INSTALLATION

NOTE

Seal all exposed terminals with silicone sealant adhesive (item 5, Appx D).

Reverse removal procedures.

TA311166

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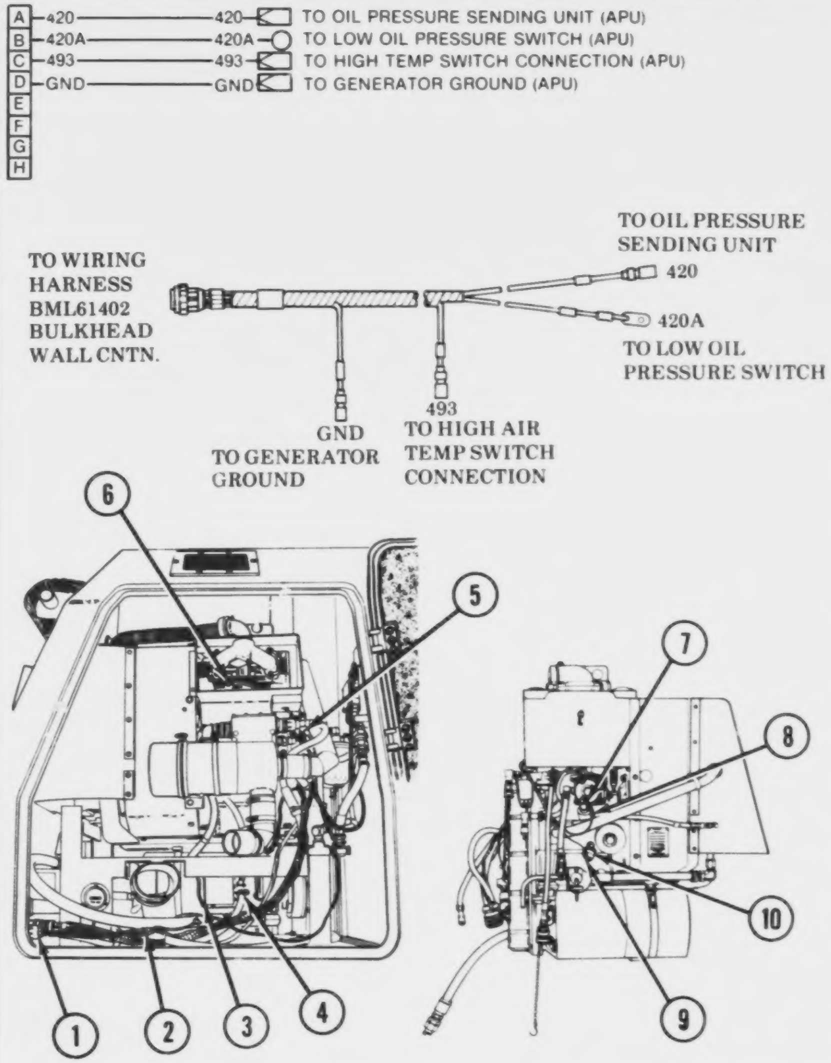
APU WIRING HARNESS (12329650): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


A 420 420 TO OIL PRESSURE SENDING UNIT (APU)
B 420A 420A TO LOW OIL PRESSURE SWITCH (APU)
C 493 493 TO HIGH TEMP SWITCH CONNECTION (APU)
D GND GND TO GENERATOR GROUND (APU)
E
F
G
H
TO WIRING HARNESS BML61402 BULKHEAD WALL CNTN.
TO OIL PRESSURE SENDING UNIT
420
420A
TO LOW OIL PRESSURE SWITCH
493
TO HIGH AIR TEMP SWITCH CONNECTION
GND
TO GENERATOR GROUND
6
5
7
8
10
9
1
2
3
4

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

Removal of left projectile rack is required (TM 9-2350-267-10).

A Remove APU access plate (p 13-13).

B Remove air intake plenum (p 13-2).

C Disconnect main receptacle (1) from vehicle harness connector located in lower left front corner of APU compartment.

D Disconnect lead GND (2) going to ground lead 12329662 (3) attached to terminal E on generator terminal box (4).

E Disconnect lead 493 (5) from lead 11671371 attached to engine high temperature switch (6).

F Disconnect lead 420 (7) going to engine oil pressure sending unit (8).

G Remove one screw and one lockwasher securing lead 420A (9) at engine low pressure switch (10).

H Remove three screws and three clamps securing wiring harness to APU.

I Remove harness from APU.

TA311167

APU WIRING HARNESS (12329650): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

NOTE

Remove electrical tape only from section of harness to be disassembled.

A Remove section of electrical tape from harness.

B Separate and isolate wiring harness branches.

C Disassemble wiring branch and replace defective wires (p 2-307).

ASSEMBLY

Reverse disassembly procedures.

INSTALLATION

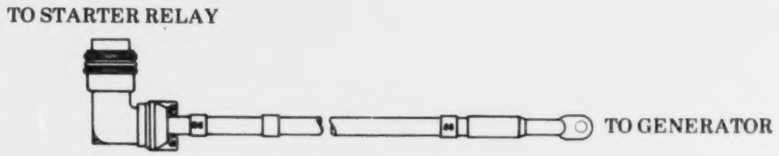
NOTE

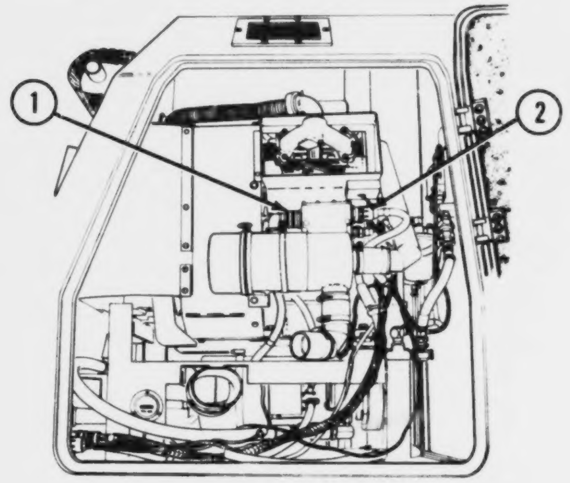
Seal all exposed terminals with silicone sealant adhesive (item 5, Appx D).

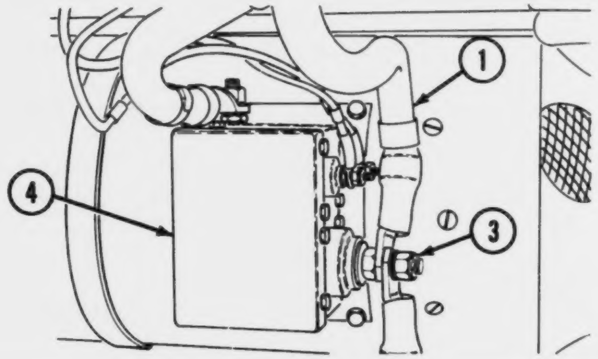
Reverse removal procedures.

TA311168

APU CABLE ASSEMBLY (12332833): REMOVAL AND INSTALLATION







REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove air intake plenum (p 13-2).

B Disconnect cable 12332833 (1) plug from starter relay (2).

C Remove nut (3) that secures cable (1) to positive terminal B at generator terminal box (4).

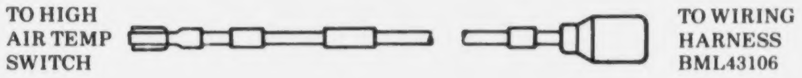
D Remove cable (1) from vehicle.

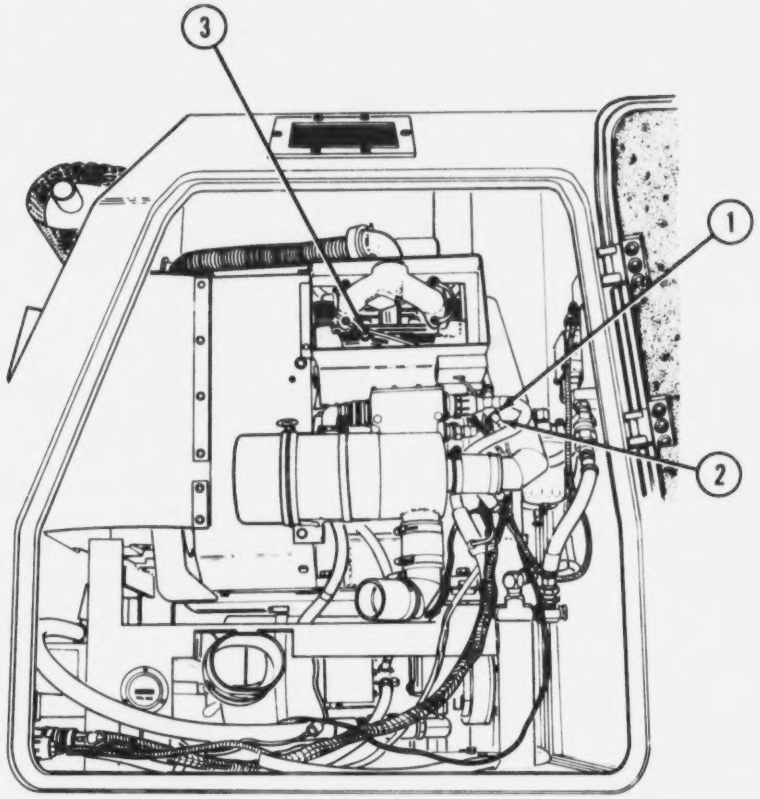
INSTALLATION

Reverse removal procedures.

TA311169

APU CABLE ASSEMBLY (11671371): REMOVAL AND INSTALLATION


TO HIGH
AIR TEMP
SWITCH
TO WIRING
HARNESS
BML43106



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect circuit 493 (1) from wiring harness 12329650 (2).

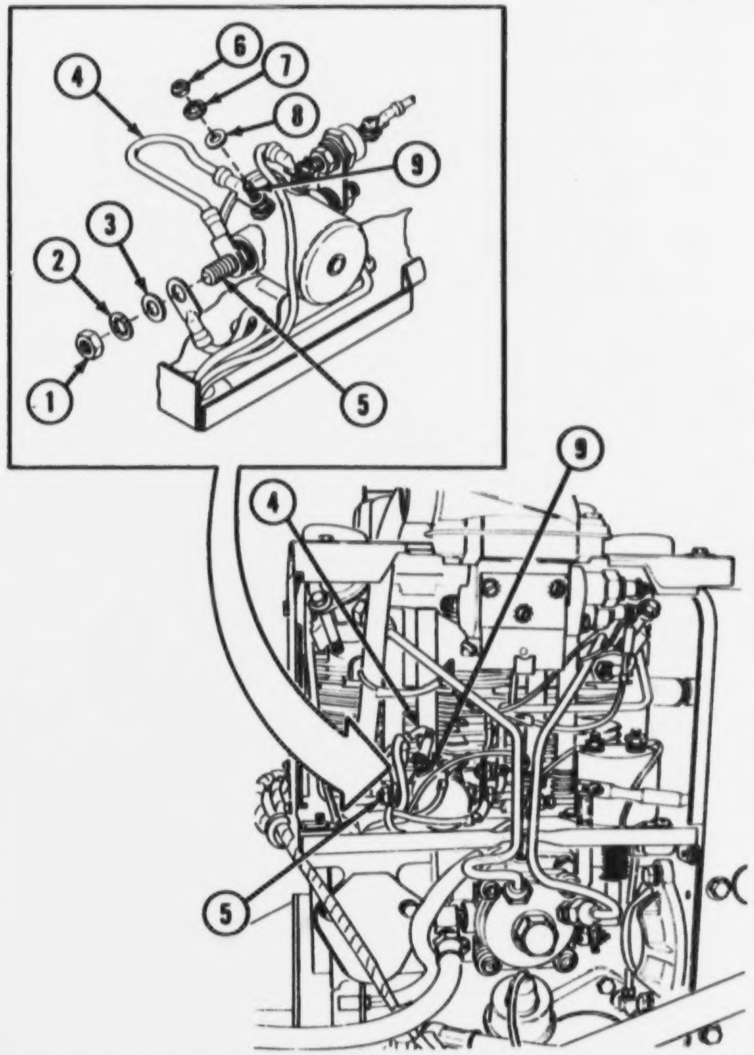
B Disconnect lead 493 (1) from high air temperature switch (3).

INSTALLATION

Reverse removal procedures.

TA311170

APU CABLE ASSEMBLY (11671380-1): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

Removal of left projectile rack is required (TM 9-2350-267-10).

A Remove APU access plate (p 13-13).

B Remove engine cylinder shroud door panel.

C Remove one nut (1), one lockwasher (2) and one flat washer (3) that secure lead (4) to preheat solenoid side terminal (5).

D Remove one nut (6), lockwasher (7) and flat washer (8) securing lead assembly P (4) to preheat solenoid top terminal (9).

INSTALLATION

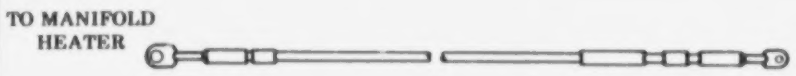
NOTE

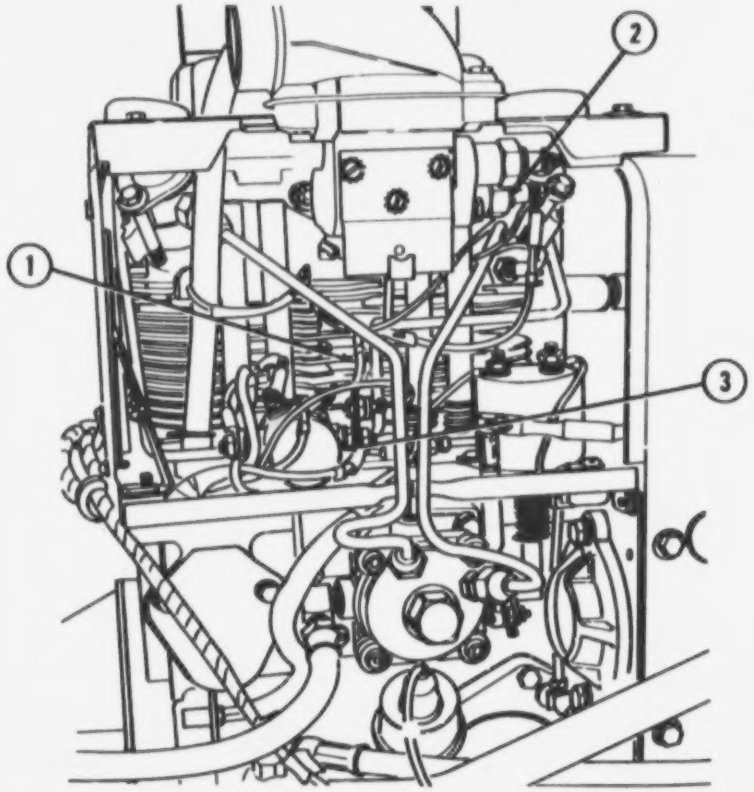
Seal exposed terminals with silicone sealant adhesive (item 5, Appx D).

Reverse removal procedures.

TA311171

APU CABLE ASSEMBLY (11671380-2): REMOVAL AND INSTALLATION





REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

Removal of left projectile rack is required (TM 9-2350-267-10).

A Remove APU access plate (p 13-13).

B Remove engine cylinder shroud door panel.

C Remove one nut, lockwasher and flat washer that secure lead assembly (1) to manifold heater (2).

D Remove one nut, lockwasher and flat washer that secure lead assembly (1) to preheat solenoid (3) side terminal.

E Remove cable from APU.

INSTALLATION

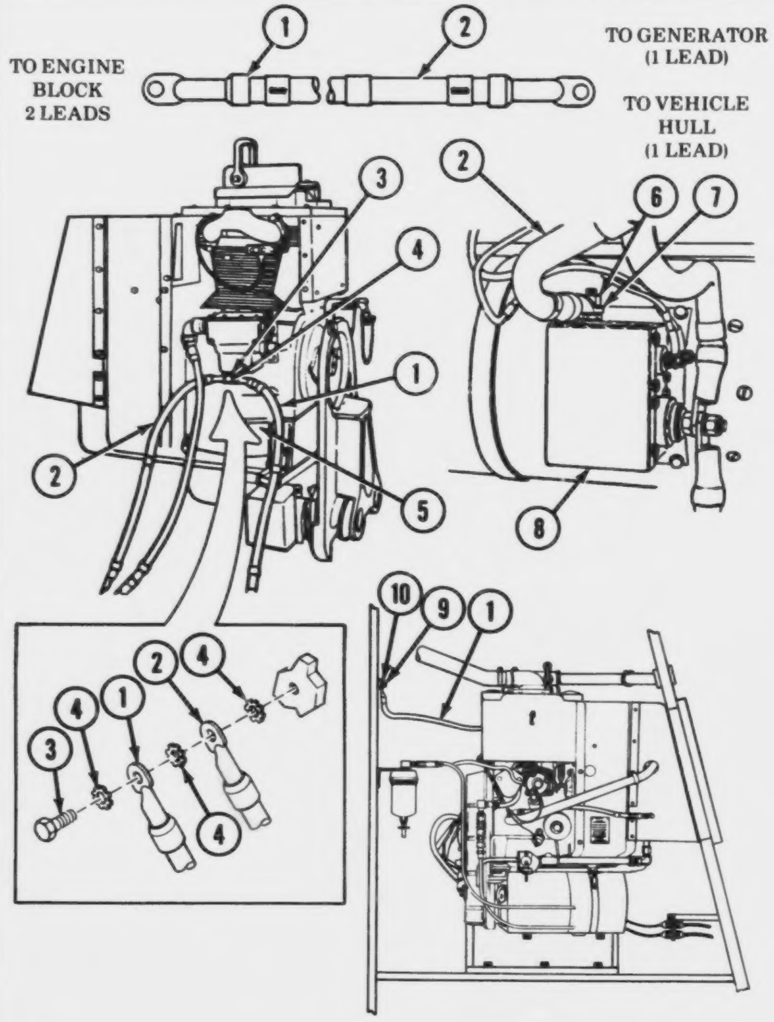
NOTE

Seal all exposed terminals with silicone sealant adhesive (item 5, Appx D).

Reverse removal procedures.

TA311172

APU GROUND CABLES (11671369-1): REMOVAL AND INSTALLATION



INITIAL SETUP

Equipment Condition:

Air intake plenum removed (p 13-2).

REMOVAL

> **WARNING**
>
> Turn OFF MASTER switch. Disconnect battery ground cables.

A Disconnect ground cables (1 and 2) by removing one screw (3) and three lockwashers (4) that secure ground cables to APU engine block (5). Discard lockwashers.

B Remove one nut (6) and one lockwasher (7) that secure ground cable (2) to generator relay box (8). Discard lockwasher.

C Remove one screw (9), one lockwasher (10) and ground cable (1) from rear wall of APU compartment. Discard lockwasher.

INSTALLATION

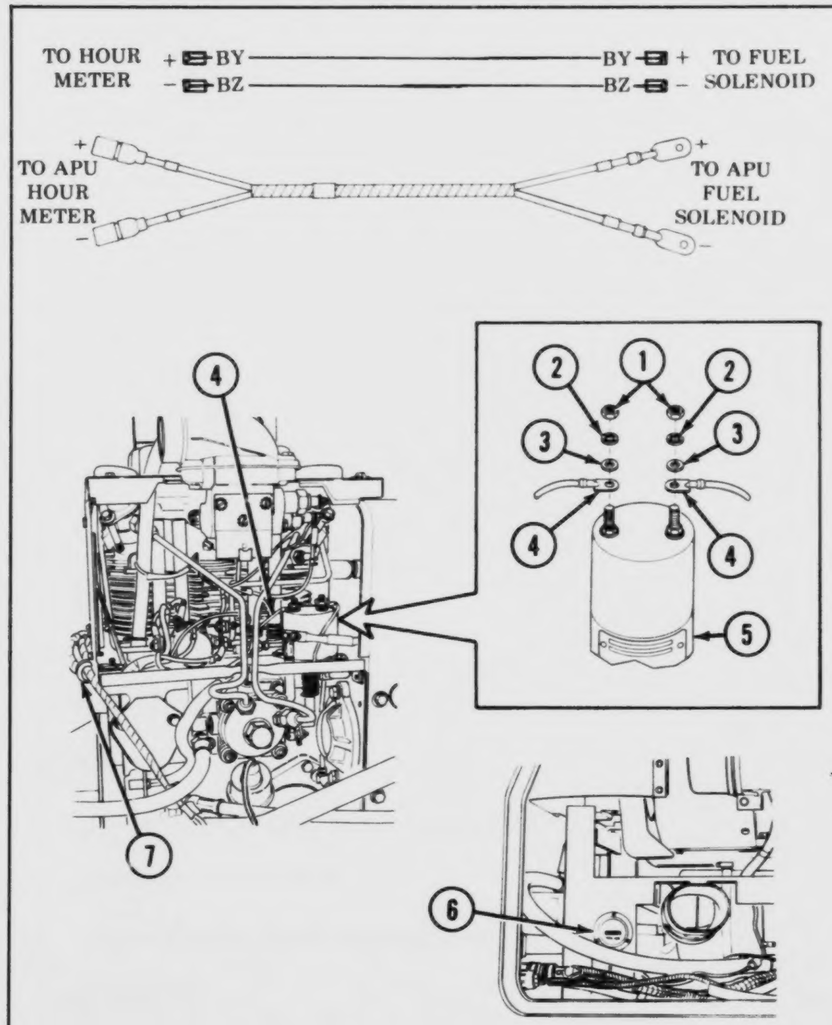
A Install ground cable (1) on rear wall of APU compartment with screw (9) and new lockwasher (10).

B Install ground cable (2) on generator relay box (8) with new lockwasher (7) and nut (6).

C Connect ground cables (1 and 2) to APU engine block (5) with screw (3) and three new lockwashers (4).

TA312822

APU WIRING HARNESS, FUEL SOLENOID TO HOURMETER (12329660): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION


TO HOUR METER
+ BY
− BZ
BY +
BZ −
TO FUEL SOLENOID
+
TO APU HOUR METER
−
+
TO APU FUEL SOLENOID
−
4
2
1
2
3
3
4
4
5
7
6

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

Removal of left projectile rack is required (TM 9-2350-267-10).

A Remove APU access plate (p 13-13).

B Remove APU intake plenum (p 13-2).

C Remove engine cylinder shroud door panel.

D Remove from each fuel solenoid terminal one nut (1), lockwasher (2) and flat washer (3).

E Disconnect harness (4) from fuel solenoid (5).

F Disconnect harness (4) connectors from APU hourmeter (6).

G Remove two screws and two clamps (7).

H Remove harness (4) from APU.

TA311174

APU WIRING HARNESS, FUEL SOLENOID TO HOURMETER (12329660): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

A Remove electrical tape from harness.

B Separate harness wires.

C Disassemble and replace defective wires (p 2-307).

ASSEMBLY

Reverse disassembly procedures.

INSTALLATION

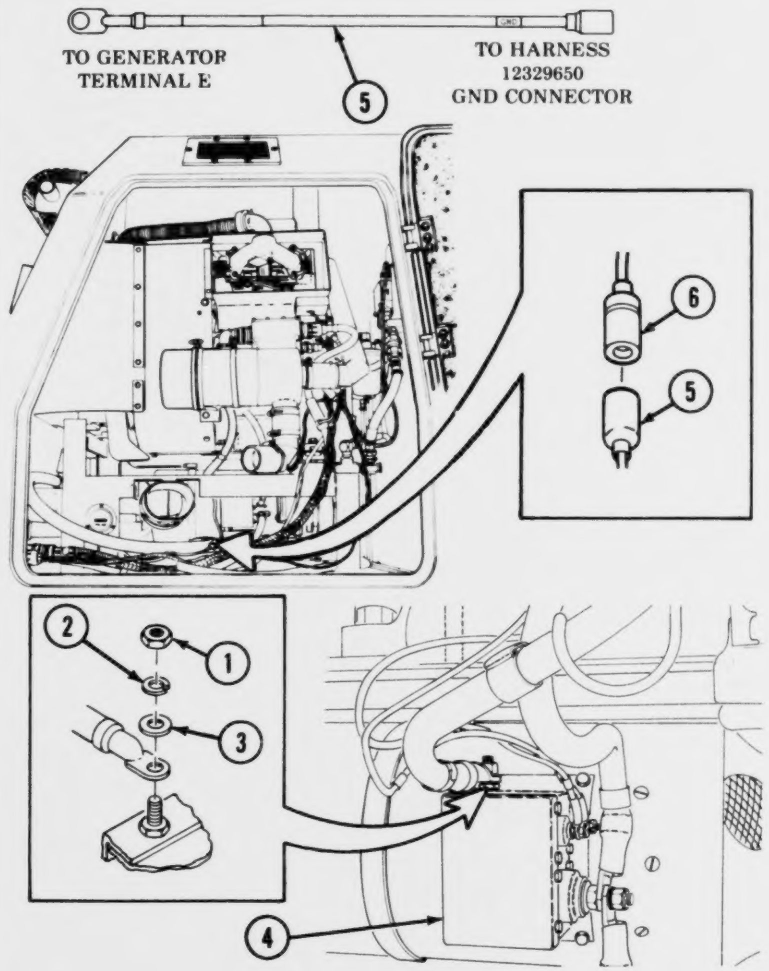
NOTE

Seal all exposed terminals with silicone sealant adhesive (item 5, Appx D).

Reverse removal procedures.

TA311175

APU CABLE (12329662): REMOVAL AND INSTALLATION


TO GENERATOR TERMINAL E
5
TO HARNESS 12329650 GND CONNECTOR
6
5
2
1
3
4

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery.

A Remove air intake plenum (p 13-2).

B Remove nut (1), lockwasher (2) and flat washer (3) from terminal E of generator terminal box (4).

C Disconnect cable (5) GND connector from harness 12329650 (6) GND connector.

D Remove cable (5) from APU.

INSTALLATION

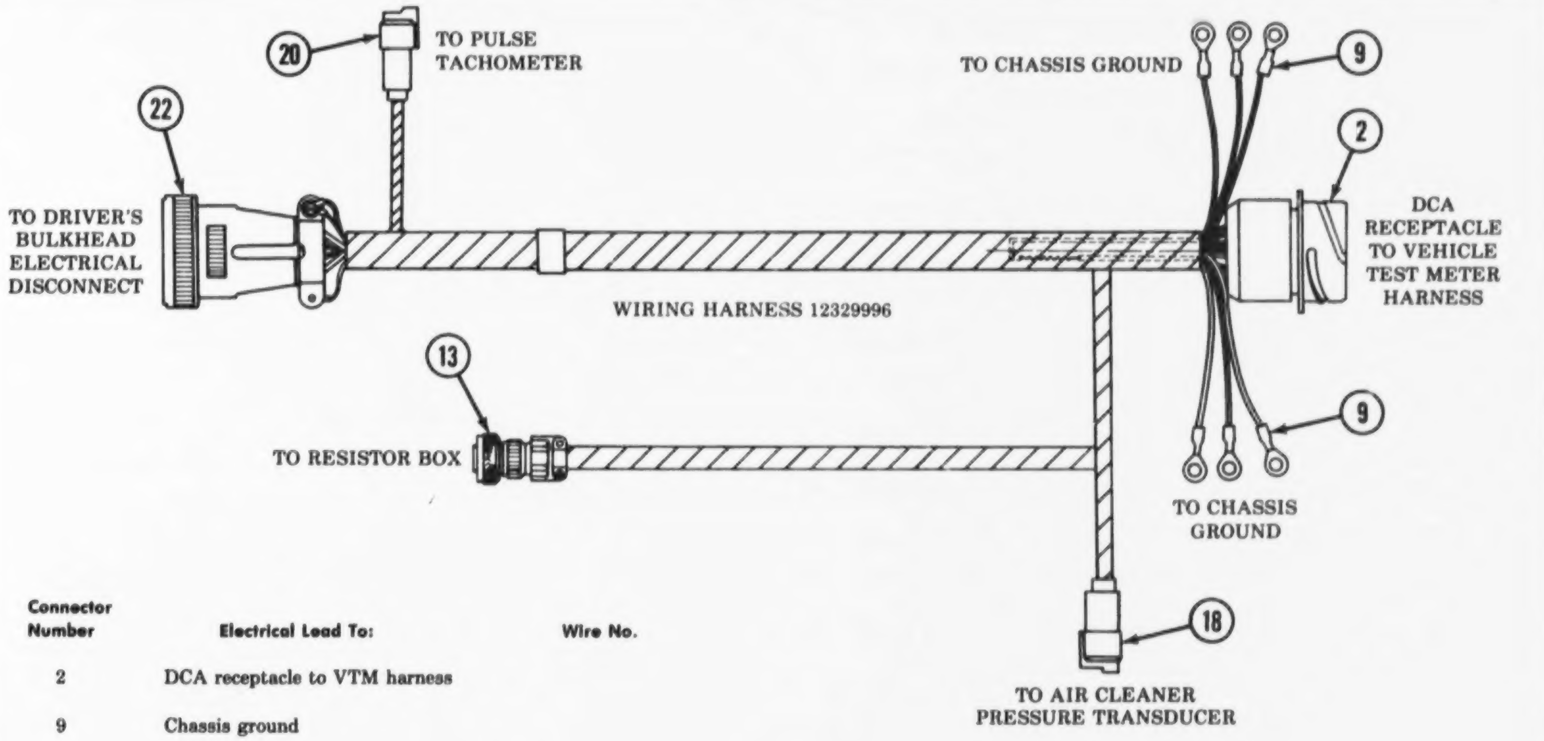
NOTE

Seal all exposed terminals with silicone sealant adhesive (item 5, Appx D).

Reverse removal procedures.

TA311176

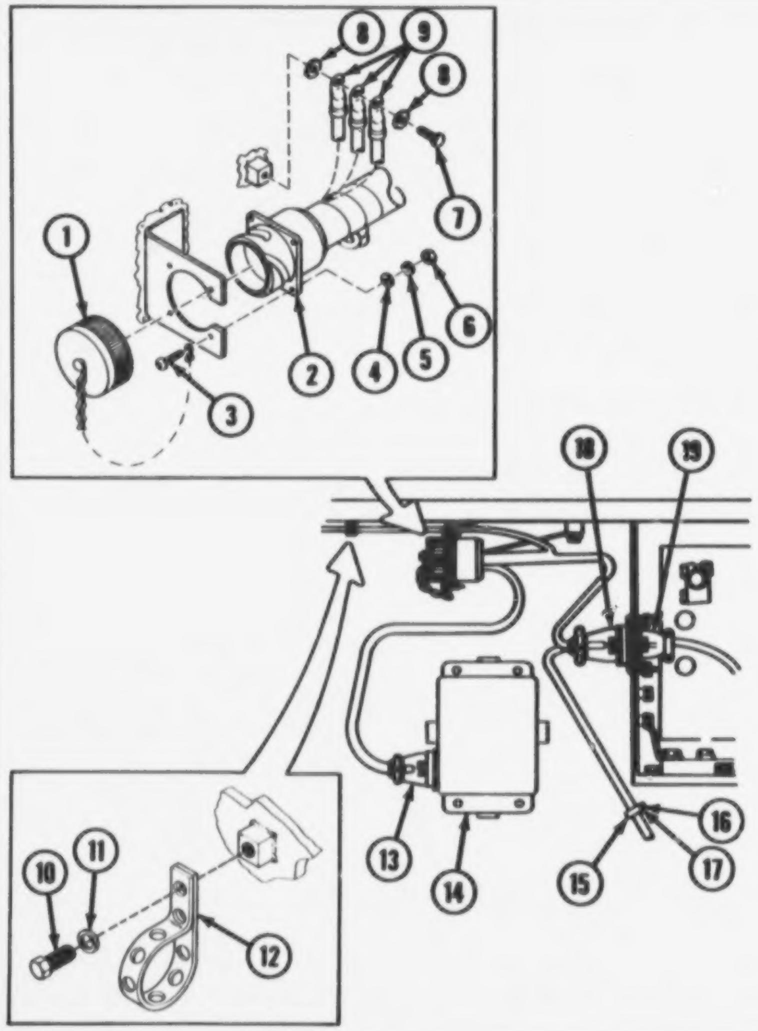
STE/ICE WIRING HARNESS, DCA TO DRIVER'S BULKHEAD (123299 6): REMOVAL AND INSTALLATION


20
TO PULSE TACHOMETER
TO CHASSIS GROUND
9
22
2
TO DRIVER'S BULKHEAD ELECTRICAL DISCONNECT
DCA RECEPTACLE TO VEHICLE TEST METER HARNESS
WIRING HARNESS 12329996
13
TO RESISTOR BOX
9
TO CHASSIS GROUND
18
TO AIR CLEANER PRESSURE TRANSDUCER

Connector Number	Electrical Lead To:	Wire No.
2	DCA receptacle to VTM harness	
9	Chassis ground	
13	Resistor box	
18	Driver's bulkhead electrical disconnect	
20	Pulse tachometer	AR, AS
22	Air cleaner pressure transducer	AU, AT, BH, BG

TA312823

STE/ICE WIRING HARNESS, DCA TO DRIVER'S BULKHEAD (12329996): REMOVAL AND INSTALLATION (CONTINUED)



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground leads before performing any maintenance.

A Open battery compartment doors.

B Unscrew dust cap (1) from DCA receptacle (2) and let cap hang by chain.

C Remove DCA receptacle (2) and dust cap (1) from vehicle bracket by removing four screws (3), four flat washers (4), four lockwashers (5) and four nuts (6). Discard lockwashers.

D Remove two screws (7) and four lockwashers (8) securing two groups of three ground leads (9) to vehicle. Discard lockwashers.

E Remove nine screws (10), nine lockwashers (11) and nine retaining straps (12). Discard lockwashers.

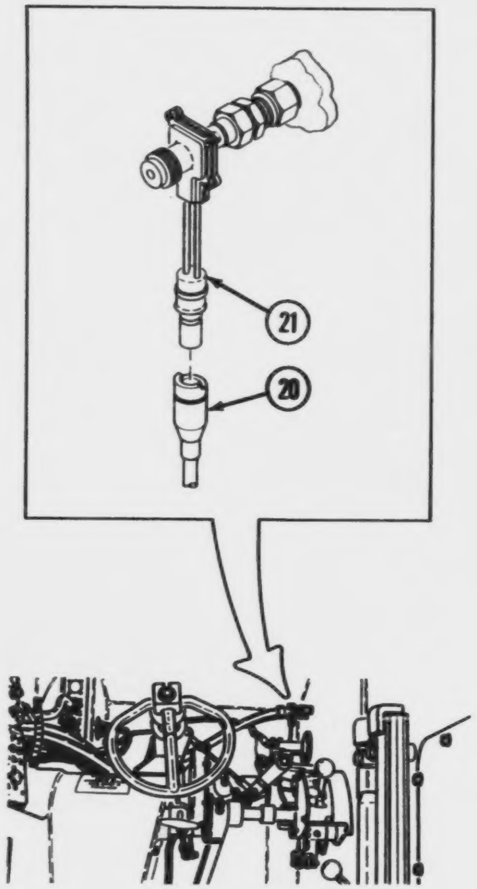
F Disconnect plug (13) from STE/ICE resistor box (14).

G Remove harness support strap (15) by removing one screw (16) and one lockwasher (17). Discard lockwashers.

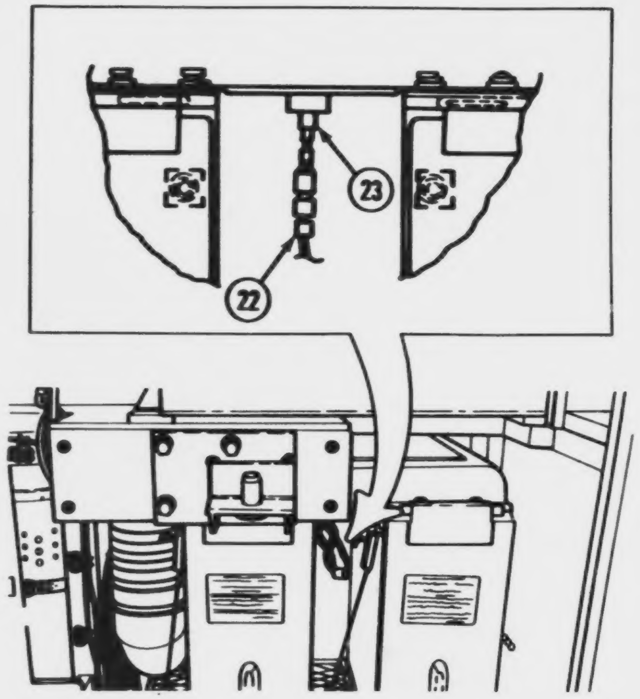
H Disconnect plug (18) from bulkhead receptacle (19).

TA312824

STE/ICE WIRING HARNESS, DCA TO DRIVER'S BULKHEAD (12329996): REMOVAL AND INSTALLATION (CONTINUED)



I Disconnect plug (20) from engine pulse tachometer (21).



J Disconnect plug (22) from air cleaner pressure transducer (23).

K Remove wiring harness from vehicle.

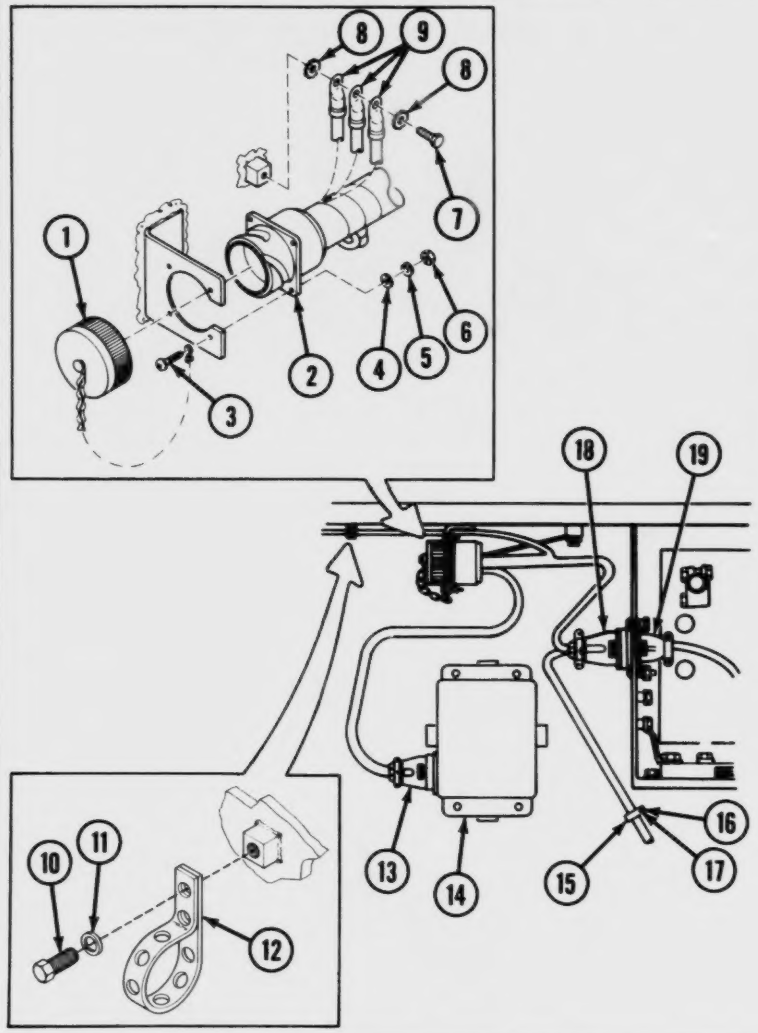
INSTALLATION

A Connect plug (22) to air cleaner pressure transducer (23).

B Connect plug (20) to engine pulse tachometer (21).

TA312825

STE/ICE WIRING HARNESS, DCA TO DRIVER'S BULKHEAD (12329996): REMOVAL AND INSTALLATION (CONTINUED)



C Connect plug (18) to bulkhead receptacle (19).

D Install harness support strap (15) with one screw (16) and one new lockwasher (17).

E Connect plug (13) to STE/ICE resistor box (14).

F Install nine retaining straps (12) with nine screws (10) and nine new lockwashers (11).

G Install two groups of three ground leads (9) with two screws (7) and four new lockwashers (8).

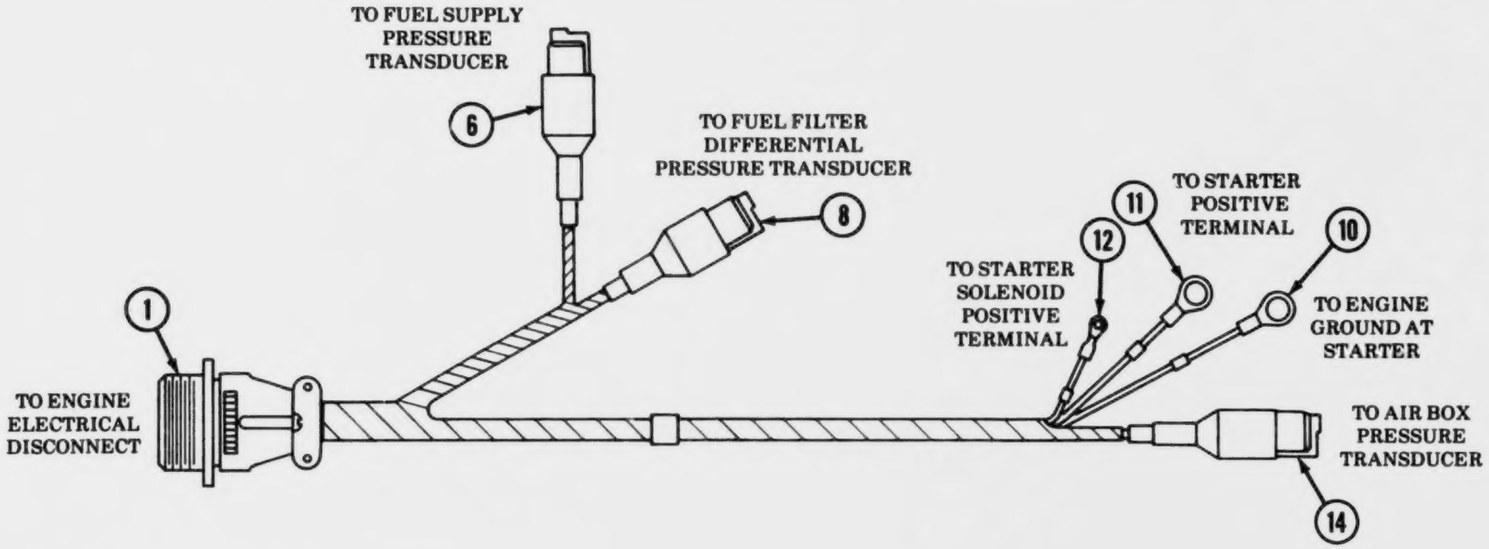
H Install DCA receptacle (2) and dust cap (1) on vehicle bracket with four screws (3), four flat washers (4), four new lockwashers (5) and four nuts (6).

I Install dust cap (1) on DCA receptacle (2).

J Close battery compartment doors.

TA312826

STE/ICE WIRING HARNESS, ENGINE TRANSDUCERS TO ENGINE ELECTRICAL DISCONNECT (12329990): REMOVAL AND INSTALLATION


TO FUEL SUPPLY PRESSURE TRANSDUCER
6
TO FUEL FILTER DIFFERENTIAL PRESSURE TRANSDUCER
8
11
TO STARTER POSITIVE TERMINAL
10
12
TO STARTER SOLENOID POSITIVE TERMINAL
TO ENGINE GROUND AT STARTER
1
TO ENGINE ELECTRICAL DISCONNECT
TO AIR BOX PRESSURE TRANSDUCER
14

Connector Number	Electrical Lead To:	Wire No.
1	Engine electrical disconnect	
6	Fuel supply pressure transducer	BJ, BK, AC, AD
8	Fuel filter differential pressure transducer	AA, AB
10	Engine ground at starter	GND-N
11	Starter positive terminal	AY
12	Starter solenoid positive terminal	AX
14	Air box pressure transducer	BN, BP, AG, AH

TA312827

STE/ICE WIRING HARNESS, ENGINE TRANSDUCERS TO ENGINE ELECTRICAL DISCONNECT (1232990): REMOVAL AND INSTALLATION (CONTINUED)

INITIAL SETUP

Equipment Condition:

Battery ground cables disconnected (6-44).
MASTER switch OFF.
Powerpack removed (p. 3-1).

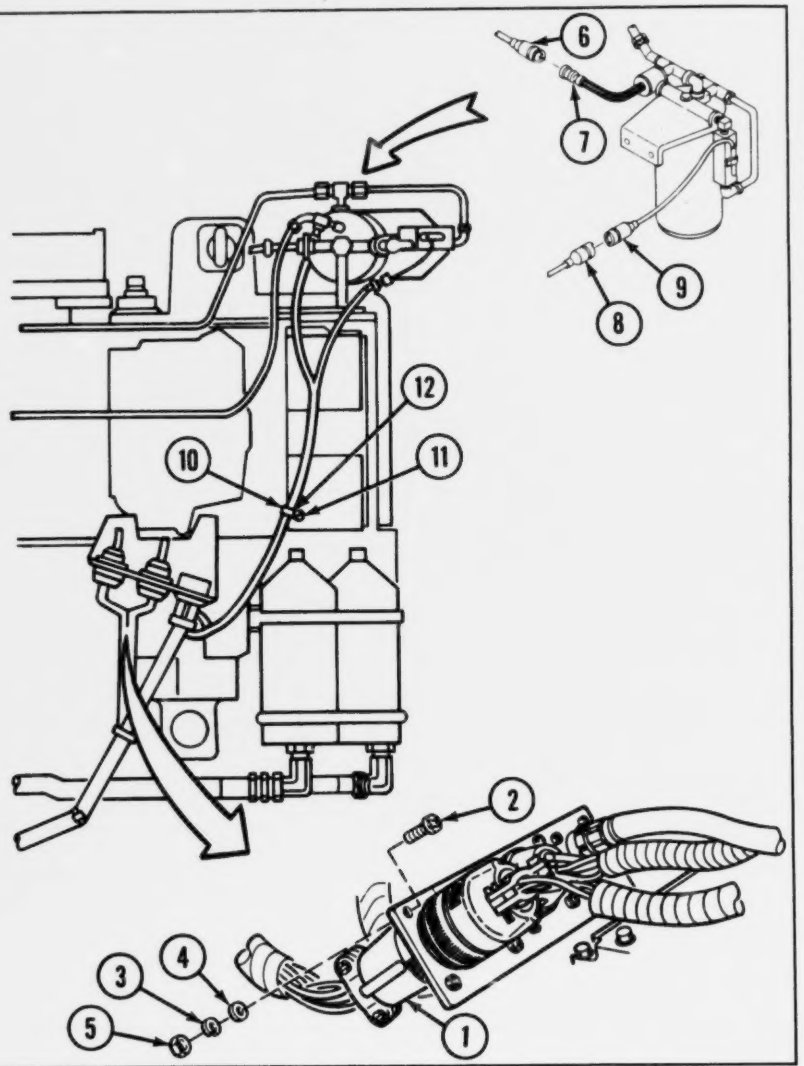
REMOVAL

A Remove harness receptacle (1) from vehicle bracket by removing four screws (2), four lockwashers (3), four flat washers (4) and four nuts (5). Discard lockwashers.

B Disconnect connector (6) from fuel supply pressure transducer (7).

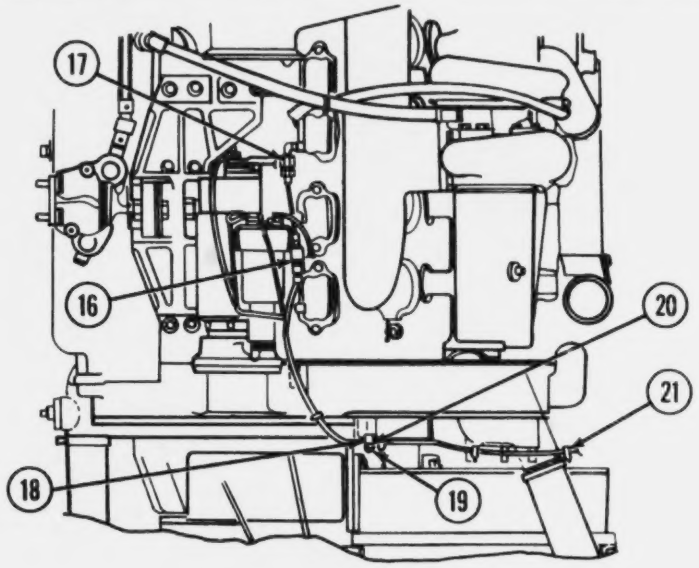
C Disconnect connector (8) from fuel filter differential pressure switch (9).

D Remove clamp (10), screw (11), and lockwasher (12). Discard lockwasher.



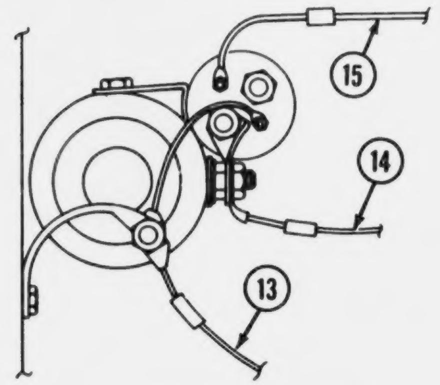
TA57465

STE/ICE WIRING HARNESS, ENGINE TRANSDUCERS TO ENGINE ELECTRICAL DISCONNECT (1232990): REMOVAL AND INSTALLATION (CONTINUED)



POWERPACK: BOTTOM VIEW

STARTER



E Disconnect ground lead (13), starter positive terminal AY (14) and starter solenoid positive terminal AX (15) from engine starter. Reinstall remaining wires on terminals.

F Disconnect connector (16) from air box pressure transducer lead (17).

G Remove clamp (18), screw (19) and lockwasher (20). Discard lockwasher.

H Remove harness from engine by removing from five tiedown straps (21). (Do not remove straps from engine and around other harnesses.)

INSTALLATION

A Install harness to engine by installing five tiedown straps (21). (21).

B Install clamp (18), screw (19) and new lockwasher (20).

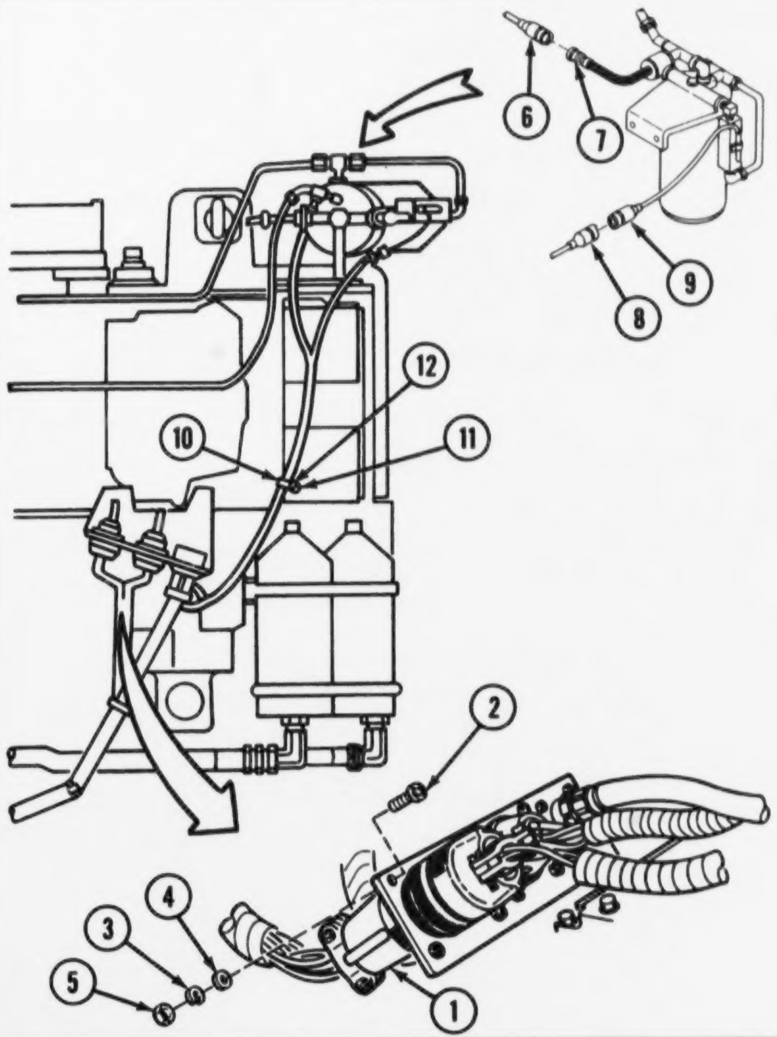
C Connect connector (16) to air box pressure transducer lead (17).

D Connect ground lead (13), starter positive terminal AY (14) and starter solenoid positive terminal AX (15) to engine starter.

E Connect connector (8) to fuel filter differential pressure switch (9).

TA58056

STE/ICE WIRING HARNESS, ENGINE TRANSDUCERS TO ENGINE ELECTRICAL DISCONNECT (1232990): REMOVAL AND INSTALLATION (CONTINUED)



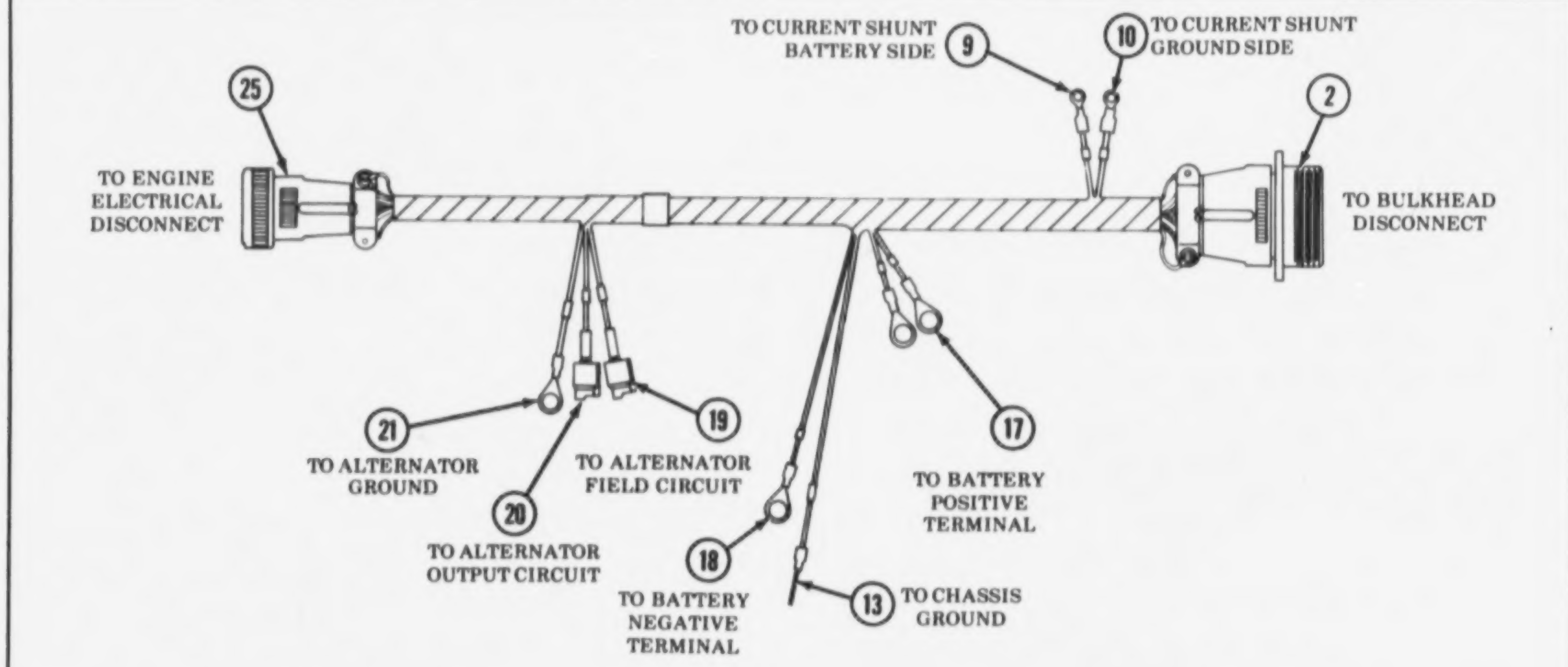
F Connect connector (6) to fuel supply pressure transducer (7).

G Install harness receptacle (1) to vehicle bracket with four screws (2), four new lockwashers (3). four flat washers (4) and four nuts (5).

H Install clamp (10), screw (11) and new lockwasher (12).

TA58046

STE/ICE DRIVER'S BULKHEAD TO ENGINE DISCONNECT (12329994): REMOVAL AND INSTALLATION (CONTINUED)

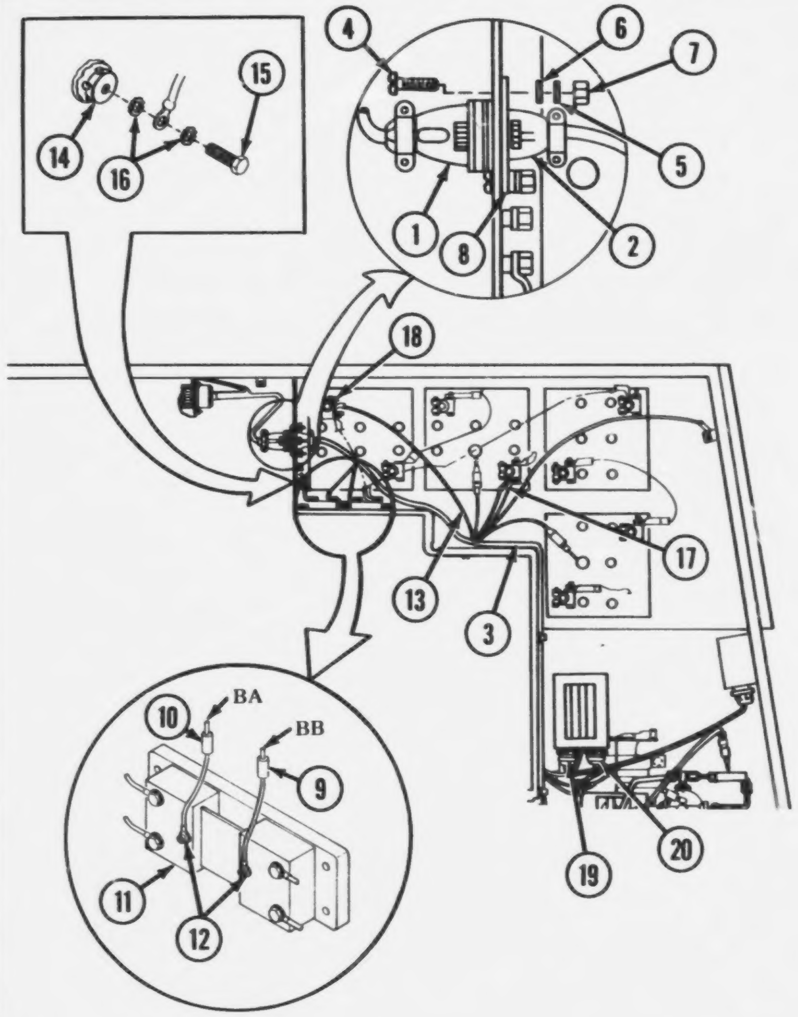


TO CURRENT SHUNT BATTERY SIDE
9
10
TO CURRENT SHUNT GROUND SIDE
25
2
TO ENGINE ELECTRICAL DISCONNECT
TO BULKHEAD DISCONNECT
21
19
17
TO ALTERNATOR GROUND
TO ALTERNATOR FIELD CIRCUIT
TO BATTERY POSITIVE TERMINAL
20
TO ALTERNATOR OUTPUT CIRCUIT
18
TO BATTERY NEGATIVE TERMINAL
13
TO CHASSIS GROUND

Connector Number	Electrical Lead To:	Wire No.	Connector Number	Electrical Lead To:	Wire No.
2	Bulkhead disconnect		18	Battery negative terminal	AZ
9	Current shunt battery side	BB	19	Alternator field circuit	AV
10	Current shunt ground side	BA	20	Alternator output circuit	AV
13	Chassis ground at battery	GND-W	21	Alternator ground	GND Z
17	Battery (+) terminal	10-V, 10-R	25	Engine electrical disconnect	

TA311186

STE/ICE DRIVER'S BULKHEAD TO ENGINE DISCONNECT (12329994): REMOVAL AND INSTALLATION (CONTINUED)



REMOVAL

A Disconnect connector (1) from bulkhead receptacle (2).

B Remove harness (3) receptacle (2) from bulkhead disconnect by removing four screws (4), four lockwashers (5), four flat washers (6), four nuts (7) and gasket (8).

C Remove current shunt leads (9 and 10) from shunt (11) by removing two screws (12).

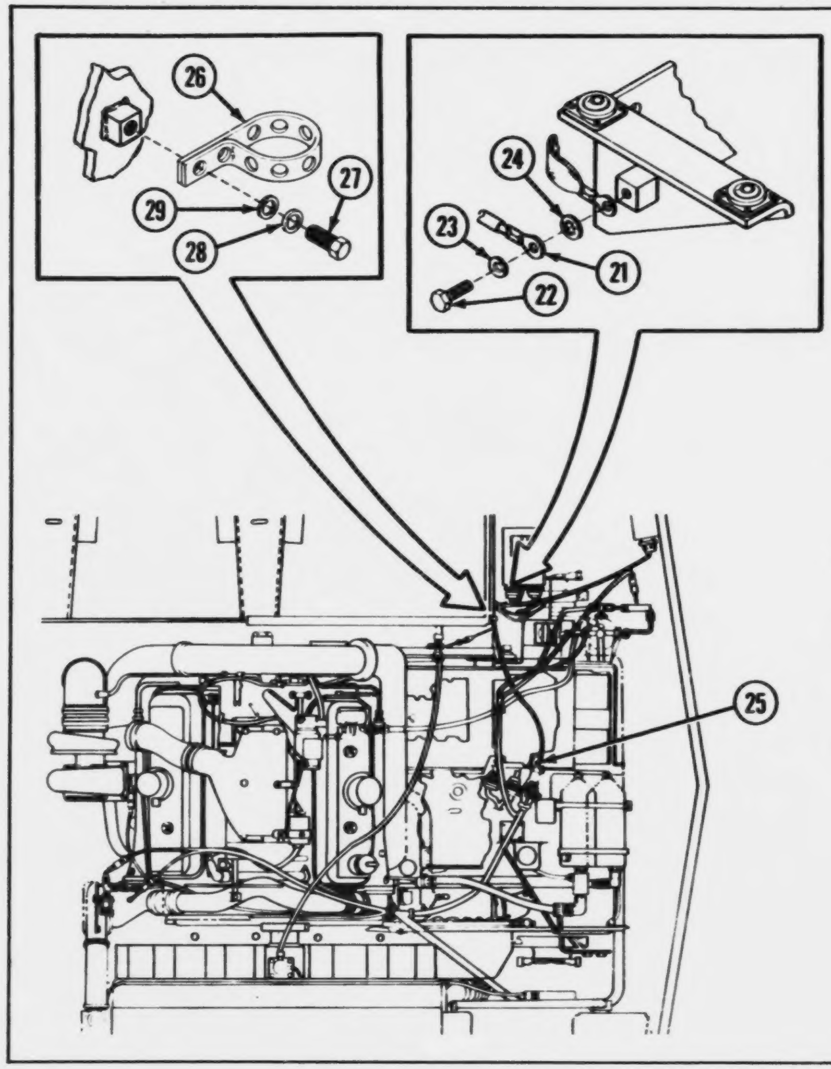
D Disconnect ground lead (13) from chassis ground connection (14) by removing screw (15) and two washers (16). Do not remove other cables from ground connection (14). Reinstall washers (16) and screw (15).

E Remove two harness leads 10V and 10R (17) from battery positive terminal.

F Remove negative battery terminal (18).

G Remove two alternator leads (19 and 20).

TA311187



H Disconnect alternator ground lead (21) by removing screw (22), washer (23) and lockwasher (24). Do not remove other cables from ground connection. Reinstall screw (22), washer (23) and lockwasher (24).

I Disconnect plug (25) from engine electrical disconnect receptacle.

J Remove four retaining straps (26) by removing from each, one screw (27), one lockwasher (28), and one flat washer (29).

K Remove harness from vehicle.

INSTALLATION

Reverse removal procedures.

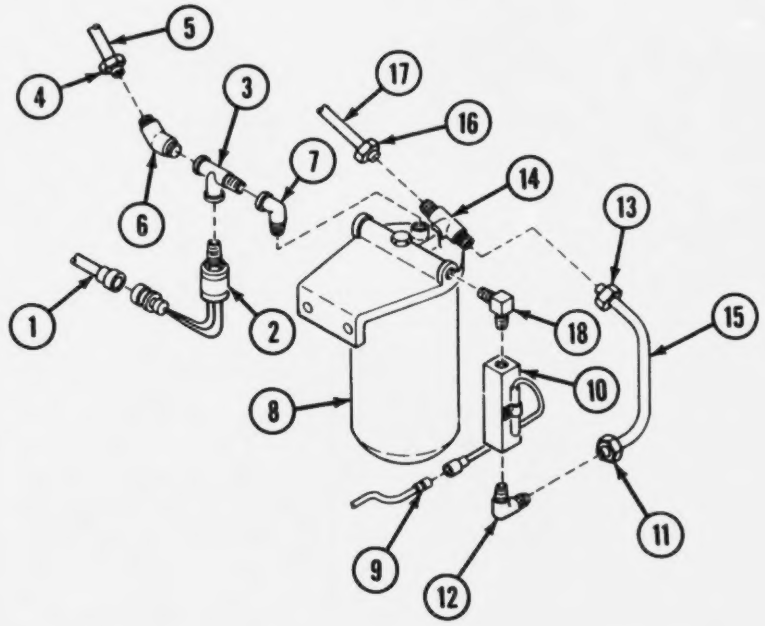
TA311188

STE/ICE FUEL PRESSURE TRANSDUCER AND DIFFERENTIAL SWITCH: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

MASTER switch OFF.
Battery ground cables disconnected (6-44).



REMOVAL

A Open and secure transmission access doors.

B Disconnect wiring harness connector (1) from fuel pressure transducer (2).

C Remove fuel pressure transducer (2) from tee (3).

D Unscrew nut (4) and disconnect hose (5).

NOTE

Note position of fittings before removing.

E Remove elbow (6) from tee (3).

F Remove tee (3) from elbow (7).

G Remove elbow (7) from fuel filter (8).

H Disconnect wiring harness connector (9) from differential switch (10).

I Unscrew nut (11) at elbow (12) and nut (13) at tee (14) and remove tube (15).

J Unscrew nut (16) at tee (14) and disconnect tube (17).

K Remove tee (14).

TA57651

STE/ICE FUEL PRESSURE TRANSDUCER AND DIFFERENTIAL SWITCH: REMOVAL AND INSTALLATION (CONTINUED)

L Remove elbow (12) from differential switch (10).

M Remove differential switch (10) and elbow (18) from fuel filter (8).

N Remove elbow (18) from differential switch (10).

INSTALLATION

A Install differential switch (10) on elbow (18).

B Install elbow (18) and differential switch (10) on fuel filter (8).

C Install elbow (12) on differential switch (10).

D Install tee (14).

E Connect tube (17) at tee (14) and tighten nut (16).

F Install tube (15) by tightening nut (13) at tee (14) and nut (11) at elbow (12).

G Connect wiring harness connector (9) to differential switch (10).

H Install elbow (7) on fuel filter (8).

I Install tee (3) on elbow (7).

J Install elbow (6) on tee (3).

K Connect hose (5) to elbow (6).

L Install fuel pressure transducer (2) on tee (3).

M Connect wiring harness connector (1) to fuel pressure transducer (2).

N Close transmission access doors.

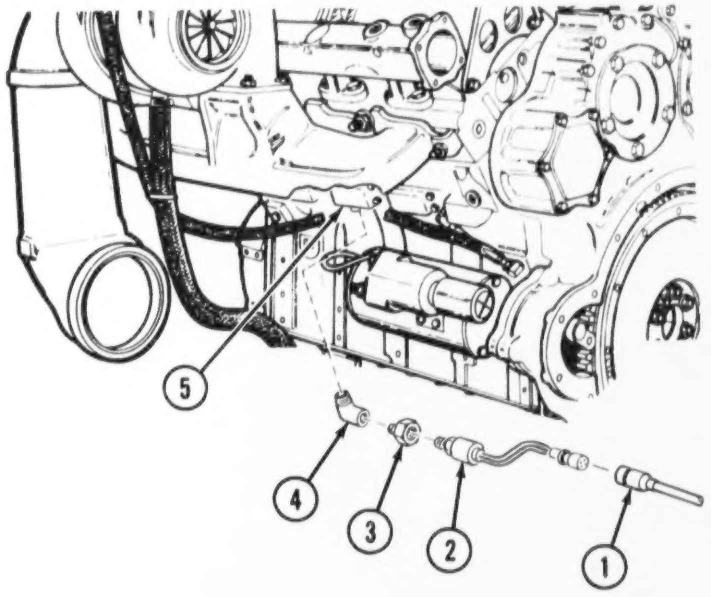
TA57661

STE/ICE AIR BOX TRANSDUCER: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Powerpack removed (p 3-1).



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground leads before performing any maintenance.

A Disconnect wiring harness connector (1) from transducer (2).

B Remove transducer (2) from pipe reducer (3).

C Remove reducer (3) from elbow (4).

D Remove elbow (4) from air box (5).

INSTALLATION

A Install elbow (4) in air box (5).

B Install reducer (3) in elbow (4).

C Install transducer (2) in pipe reducer (3).

D Connect wiring harness connector (1) to transducer (2).

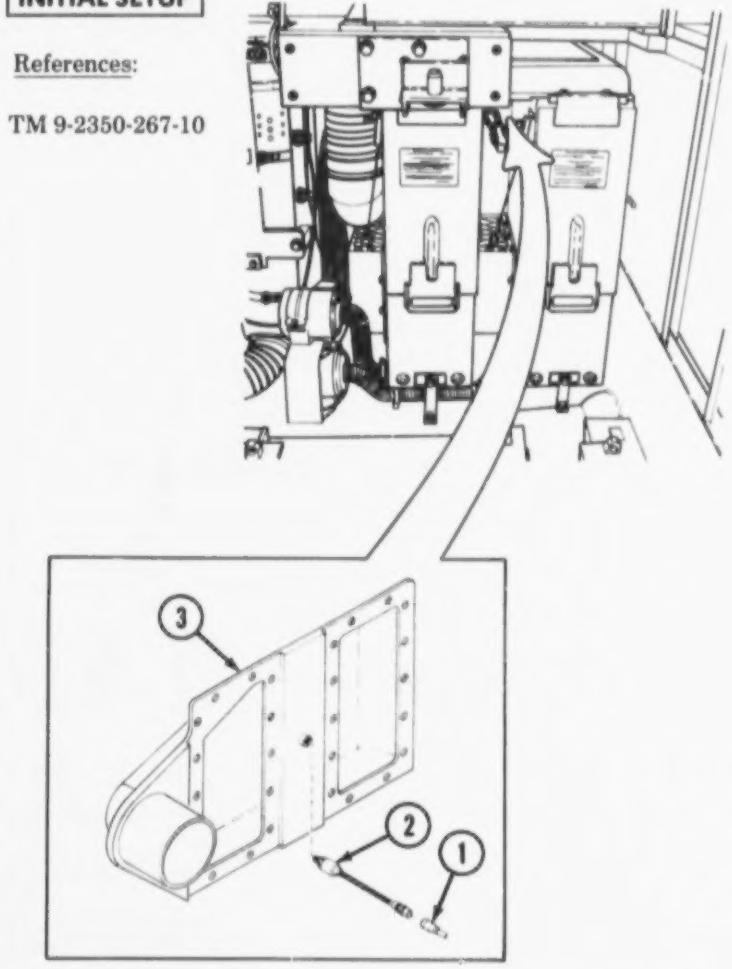
TA312829

STE/ICE AIR CLEANER TRANSDUCER: REMOVAL AND INSTALLATION

INITIAL SETUP

References:

TM 9-2350-267-10



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground leads before performing any maintenance.

A Move right projectile rack to rear (TM 9-2350-267-10).

B Disconnect wiring harness connector (1) from transducer (2).

C Remove transducer (2) from air cleaner (3).

INSTALLATION

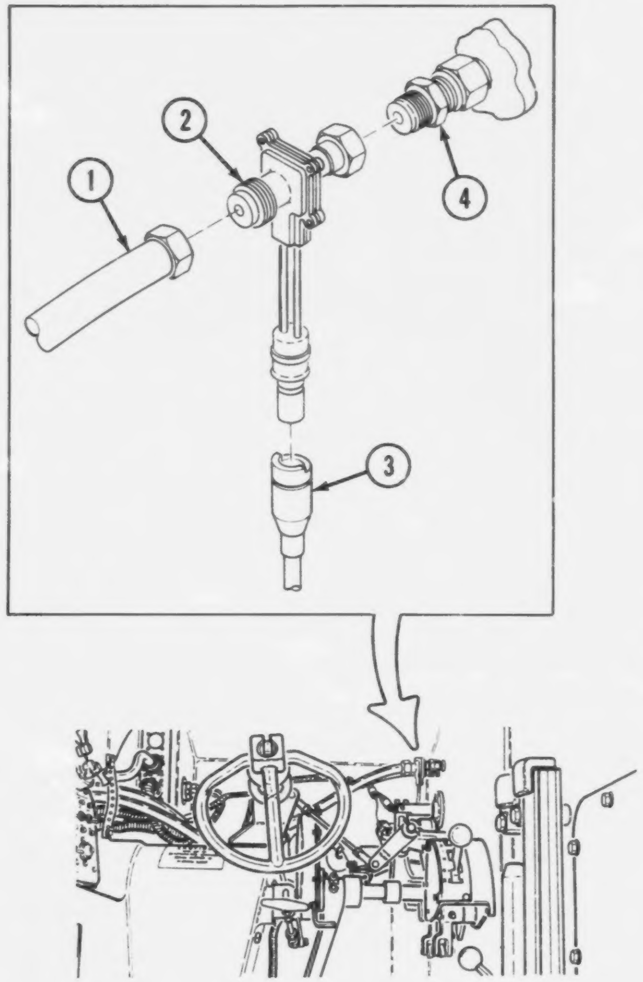
A Install transducer (2) on air cleaner (3).

B Connect wiring harness connector (1) to transducer (2).

C Move right projectile rack into position (TM 9-2350-267-10).

TA312830

STE/ICE PULSE TACHOMETER: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground leads before performing any maintenance.

A Disconnect tachometer cable connector (1) from pulse tachometer (2).

B Disconnect plug (3) from pulse tachometer (2).

C Remove pulse tachometer (2) from adapter (4).

INSTALLATION

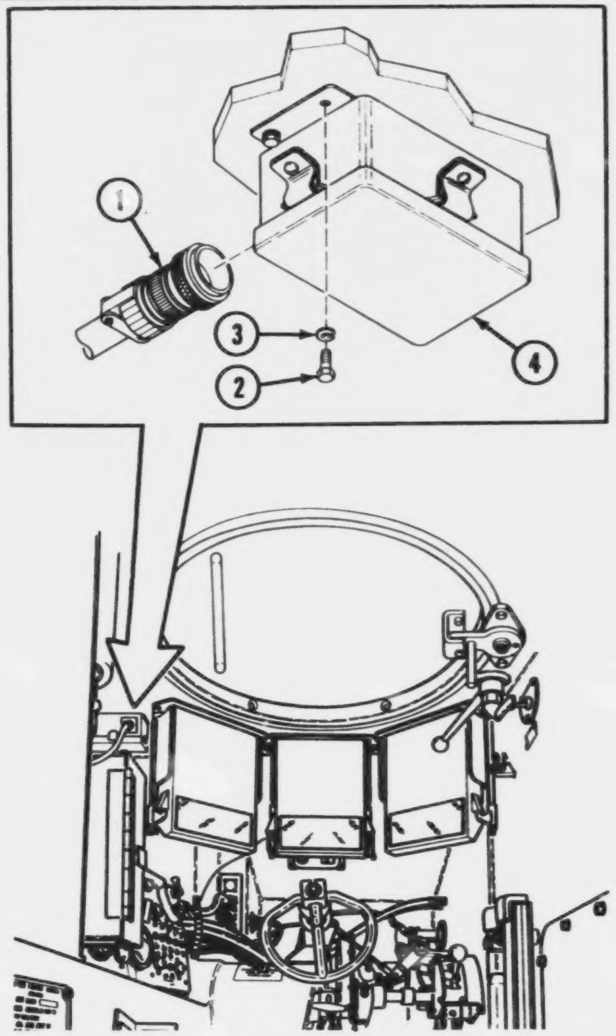
A Install pulse tachometer (2) on adapter (4).

B Connect plug (3) to pulse tachometer (2).

C Connect tachometer cable connector (1) to pulse tachometer (2).

TA312831

STE/ICE RESISTOR BOX: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground leads before performing any maintenance.

A Disconnect STE/ICE control cable (1).

B Remove four screws (2) and four lockwashers (3) to remove STE/ICE resistor box (4) from driver's compartment bulkhead. Discard lockwashers.

INSTALLATION

A Install STE/ICE resistor box (4) on driver's compartment bulkhead with four screws (2) and four new lockwashers (3).

B Connect STE/ICE control cable (1).

TA312832

CHAPTER 7
MAINTENANCE PROCEDURES
TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES

CHAPTER OVERVIEW

This chapter illustrates and describes the testing and adjustments of the transmission, transfer and drive control assemblies.

Procedures are designed to show the proper sequence of actions required to perform the maintenance tasks.

This chapter contains the following sections:

Section I	Transmission, Transfer and Drive Control Assemblies - Components/Tests
Section II	Transmission, Transfer and Drive Control Assemblies - Adjustment

Section I TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — COMPONENTS/TESTS

GENERAL

This section contains instructions for testing components of the transmission, transfer and drive control assemblies. These testing procedures are organizational maintenance.

TRANSMISSION PRESSURE CHECKS

OIL CHECK

The cross-drive transmission is lubricated by oil. Whenever the transmission oil level is found to be low, it is due to leakage. Source of leakage must be determined and the condition corrected to avoid damage to transmission. Notify Support Maintenance personnel.

PREPARATION CHECK

Check oil level before starting the engine. After the engine starts, check lubricating oil pressure. The minimum oil pressure is 10 psi at 1000 rpm.

TA310091

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — COMPONENT TESTS (CONTINUED)

MAIN AND LUBRICATING OIL PRESSURE AND OIL TEMPERATURE CHECK

During the following tests, observe the oil pressure and oil temperature gages on portable instrument panel. The oil temperature should be approximately 220°F for normal operation. If the oil temperature exceeds 300°F in any of the tests, the engine should be stopped and the cause determined. Small variations in pressure from those given in table 7-1 (p 7-5) do not necessarily mean that malfunctions exist. Malfunctions will cause radical changes in pressure.

GENERAL INSPECTION AND REPAIR PROCEDURES

The technician will perform a visual inspection of transmission-related components during removal and disassembly.

During inspection, look for the following conditions and take indicated action:

A Stripped or damaged threads on retaining bolts, nuts, or studs:

Repair threads or replace bolts, nuts, or studs as needed.

B Broken screws or bolts:

Drill and remove with stud remover. Replace broken screw or bolt.

C Bent, distorted, or damaged control rods and tubes:

Straighten, repair, or replace rods and tubes as appropriate.

D Rod ends fit too loosely on retaining pins:

Readjust rods as specified in appropriate control system instructions. Replace rod ends if bearing wear is excessive.

E Improper alinement of control systems. Adjust appropriate control linkages.

F Cracked, distorted, or damaged bell crank and support assemblies:

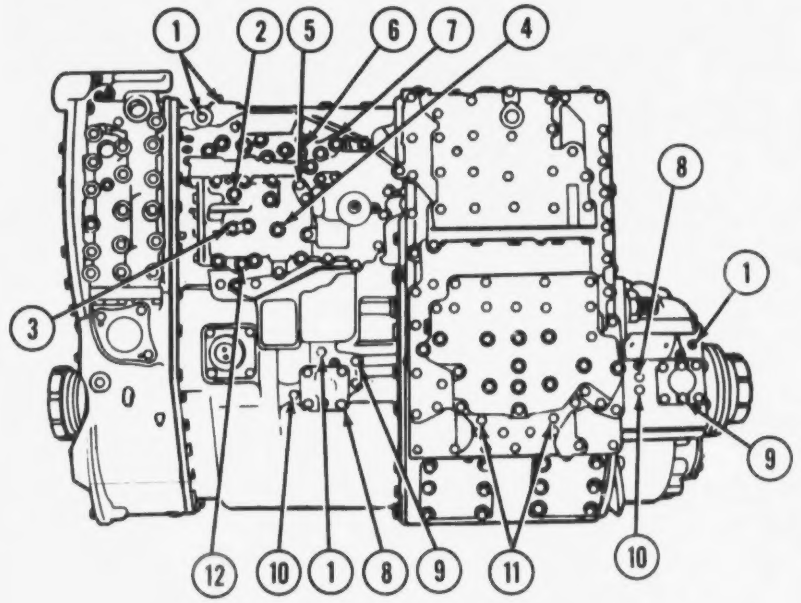
Replace as required.

PRESSURE CHECK POINTS

To aid in troubleshooting and testing, a number of plugged openings are provided for checking operating pressures. These plugs can be removed for connection of pressure gages. Use these test pressure points to locate abnormal pressures that indicate transmission malfunctions. Table 7-1 lists normal oil pressures under various operating conditions with an engine speed of 1000 to 1500 rpm (p 7-5).

TA310092

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — PRESSURE CHECKS (CONTINUED)



LEGEND

1	Transmission lubrication fittings (4)
2	Pitot
3	Throttle valve
4	Main
5	Third gear
6	Fourth gear
7	First gear
8	Geared steer clutch
9	Geared steer coolant (2)
10	Output clutch (2)
11	Brake (2)
12	Throttle

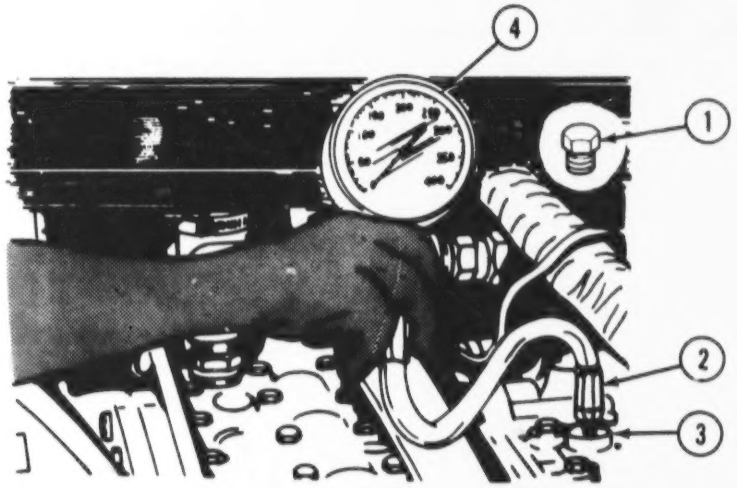
TA310093

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — PRESSURE CHECKS (CONTINUED)

CAUTION

Stop engine before removing or installing pipe plugs and attaching gage adapter. Install plug as soon as gage adapter is removed. Remove only the plug necessary to perform the desired test.

TYPICAL TEST HOOK-UP



TEST

A Identify required test port from pages 7-3 and 7-5 and remove pipe plug (1). Set plug aside for reinstallation.

B Screw gage assembly hose (2) into port (3).

C Start up engine and operate (TM 9-2350-267-10), following rpm instructions on page 7-3 for 12 test ports.

D Read from gage (4), in compliance with instructions on page 7-5 for 12 test ports.

NOTE

After completing all pressure tests, if pressure readings are above or below limits identified on page 7-5, notify Support Maintenance.

E Shut down engine and remove gage assembly hose (2).

F Install pipe plug (1).

TA310094

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — PRESSURE CHECKS (CONTINUED)

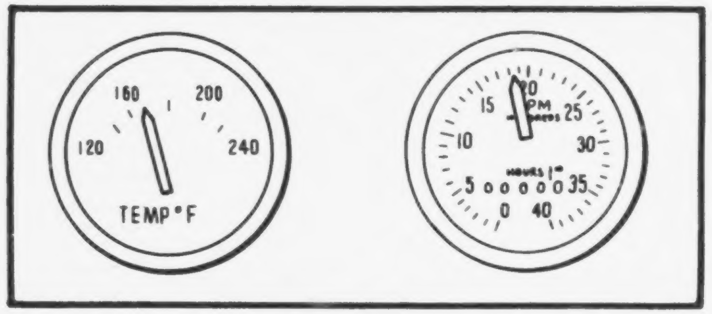
Table 7-1 Transmission Oil Pressures

	Check Point No.	RPM	Reading	Neutral	1st Gear	2nd Gear	3rd Gear	4th Gear	Reverse 1	Reverse 2	Right Steer	Left Steer
Main pressure in converter	4	1000 to 1500	Normal	210-230	210-230	210-230	210 -230	118-160	300-320	300-320	Same as range reading	
			Actual									
Main pressure in lockup	4	1000 to 1500	Normal	118-160	118-160	118-160	118-160	118-160	160-190	160-190	Same as range reading	
			Actual									
Lockup and range clutch apply pressure	4	1000 to 1500	Normal	Same as main pressure for applicable range								
			Actual									
1st, neutral, and reverse 1 signal pressure	7	1000 to 1500	Normal	Same as main pressure for applicable range								
			Actual									
3rd, 4th and reverse 2 signal pressure	5-6	1000 to 1500	Normal	Same as main pressure for applicable range								
			Actual									
Geared steer apply pressure (no steer)	8	1000 to 1500	Normal	210	210	0	0	0	210	0	0	0
			Actual									
Geared steer apply pressure (during steer)	10	1000 to 1500	Normal	0	0	0	0	0	0	0	74-127	74-127
			Actual									
Brake apply pressure	11	1000 to 1500	Normal	0	0	0	0	0	0	0	74-127	74-127
			Actual									
Geared steer and brake coolant pressure	9	1000 to 1500	Normal	0	0	0	0	0	0	0	8-12	8-12
			Actual									
Output clutch pressure	10	1000 to 1500	Normal	0	0	210	210	118-160	0	210	0*	0*
			Actual									
Governor pressure (pitot) at lockup engagement	2	1000 to 1500	Normal	82-88	82-88	82-88	82-88	82-88	82-88	82-88	82-88	82-88
			Actual									
Lubrication pressure	1	1835 to 1900	Normal	18-45	18-45	18-45	18-45	18-45	18-45	18-45	18-45	18-45
			Actual									
Throttle (T) pressure	12	Full throttle	Normal	32-40	32-40	32-40	32-40	32-40	32-40	32-40	32-40	32-40
			Actual									
Throttle valve (TV) pressure	3	Full throttle	Normal	32-40	32-40	32-40	32-40	32-40	32-40	32-40	32-40	32-40
			Actual									

* On side toward which turn is made.

TA310095

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — STALL TEST



TEST

NOTE

The stall test is done to check performance of the engine and transmission.

A Check engine and transmission oil levels. Operate engine until normal operating temperature of 170°F is reached.

CAUTION

Do not stall engine for more than 15 seconds or the transmission oil temperature will go too high.

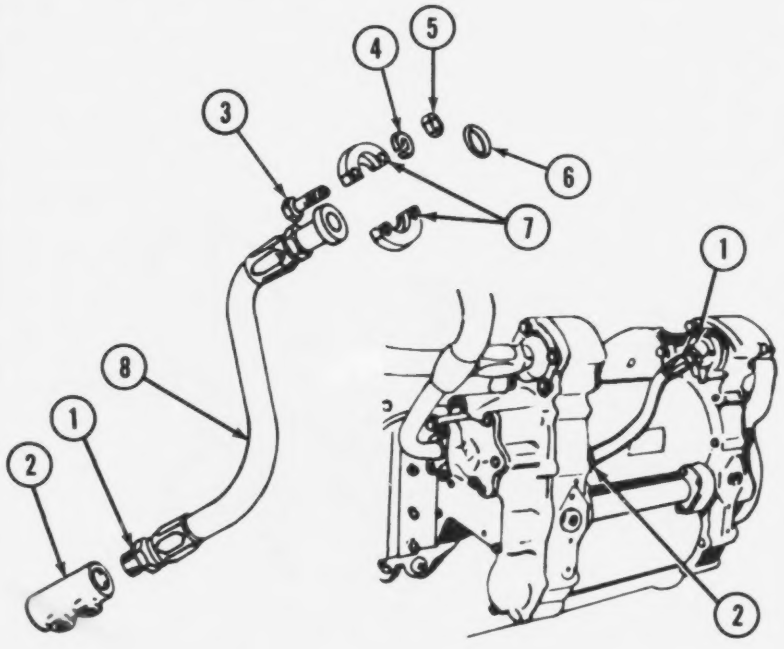
B Lock brakes and put transmission in fourth gear. Run engine at full throttle for 15 seconds.

C If engine speed is below 1850 rpm, it indicates engine is not operating properly. If fuel flow test (p 4-22) and linkage adjustments (p 7-46) are correct, notify Support Maintenance that check of engine performance is required.

D If engine speed exceeds 2075 rpm, check throttle linkage (p 7-46). If correct, notify Support Maintenance to check for slippage in transmission.

TA310096

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — OIL FILTER AND OIL COOLER HOSES: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Be sure exhaust pipes are cool before removing hoses.

A Remove power pack (p 3-1).

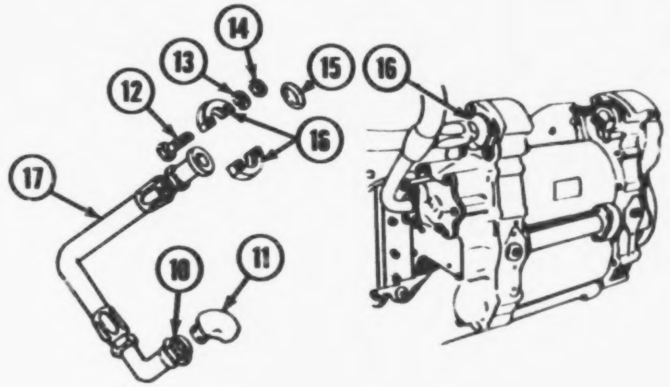
B Unscrew nut (1) from hose fitting (2) at manifold.

C Remove four screws (3), four lockwashers (4), four nuts (5), preformed packing (6) and split flange (7). Discard preformed packing (6).

D Remove hose connecting transmission to transmission oil cooler (8).

TA310097

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — OIL FILTER AND OIL COOLER HOSES: REMOVAL AND INSTALLATION (CONTINUED)



E Unscrew nut (10) at elbow (11).

F Remove four screws (12), four lockwashers (13), four nuts (14), preformed packing (15) and split flange (16). Discard preformed packing (15).

G Remove hose (17) connecting transmission oil cooler with transmission.

INSTALLATION

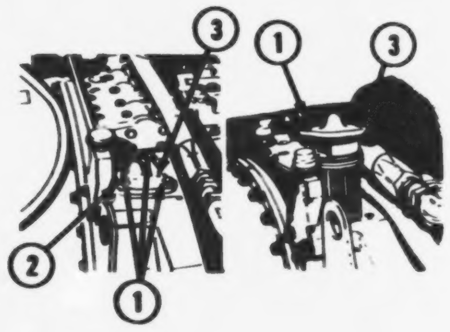
A Replace preformed packings (6 and 15) at assembly.

B Check oil level and replenish as required (LO 9-2350-267-12).

C Install oil filter and oil cooler in reverse order of removal.

TA310098

TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — OIL FILTER: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

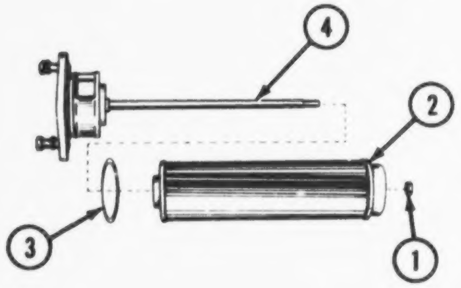
A Remove front slope plate (p 3-5 thru 3-8).

B Remove three screws and three lockwashers (1).

C Remove oil filter (2) by lifting up.

NOTE

If filter cannot be removed, insert two screws (1) into puller screw holes (3) and lift out.



DISASSEMBLY

A Remove nut (1) from oil filter (2).

B Separate filter element (2) and preformed packing (3) from rod assembly (4).

C Discard filter element (2) and preformed packing (3).

ASSEMBLY

A Replace filter element (2) and preformed packing (3).

B Assemble oil filter in reverse order of disassembly.

INSTALLATION

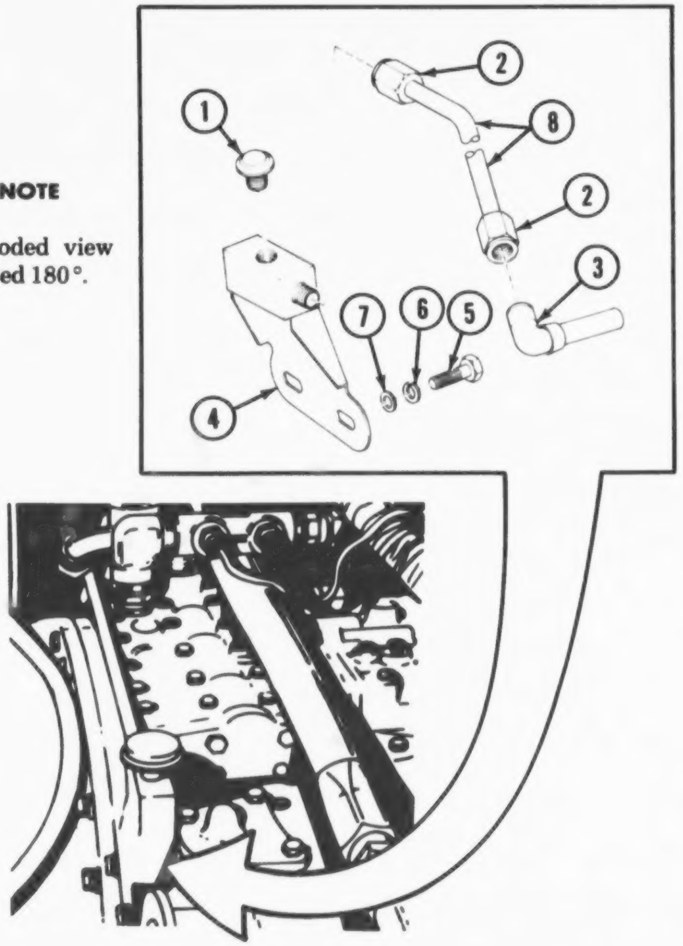
Install oil filter in reverse order of removal.

TA310099

BREATHER TUBE, FILTER AND MOUNT: REMOVAL AND INSTALLATION

NOTE

Exploded view rotated 180°.



REMOVAL

A Remove breather filter (1).

B Loosen two nuts (2) at elbow (3) and mount (4).

C Remove two screws (5), two lockwashers (6) and two flat washers (7). Discard lockwashers..

NOTE

Breather tube can be removed without removing mount.

D Remove mount (4) and breather tube (8).

E Clean breather tube (8).

INSTALLATION

NOTE

Do not tighten screws.

A Install mount (4) loosely with two screws (5), two new lockwashers (6) and two flat washers (7).

B Install breather tube (8).

C Tighten nuts (2).

D Tighten two screws (5).

E Install breather filter (1).

TA312833

STEERING CONTROL LINKAGE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

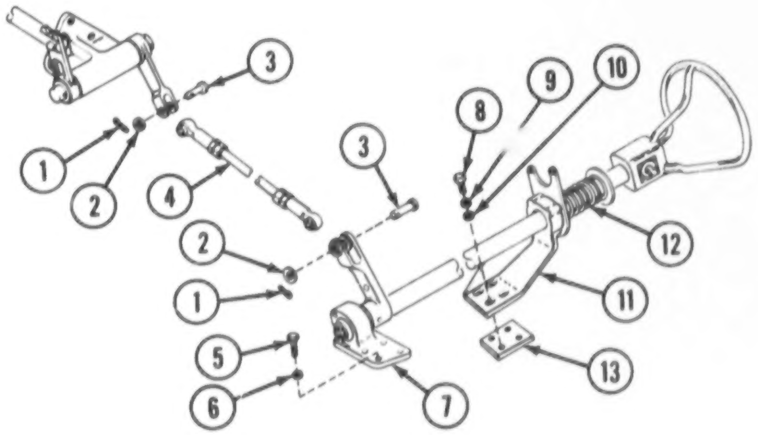
INITIAL SETUP

Materials/Parts:

Lubricant, solid, wax base, Nylube 150 (item 72, Appx D)

Equipment Condition:

Vehicle tracks chocked.



REMOVAL

A Open transmission access doors.

B Remove master warning light assembly from steering shaft mount (p 7-53).

NOTE

Rod assembly (4) is connected between steering shaft and bulkhead-mounted housing.

C Remove two cotter pins (1), two flat washers (2), two pins (3) and rod assembly (4). Discard cotter pins.

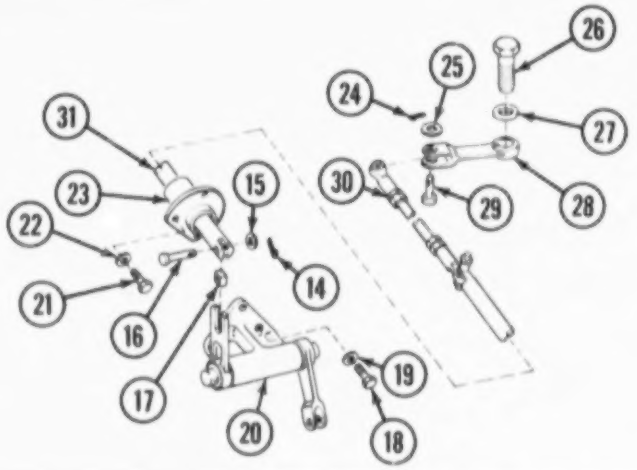
D Remove four screws (5) and four lockwashers (6) from bracket (7). Discard lockwashers.

E Remove four screws (8), four lockwashers (9) and four flat washers (10) from bracket (11). Discard lockwashers.

F Remove steering shaft assembly (12) with two brackets (7 and 11), and spacer (13) from driver's compartment.

TA57671

STEERING CONTROL LINKAGE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



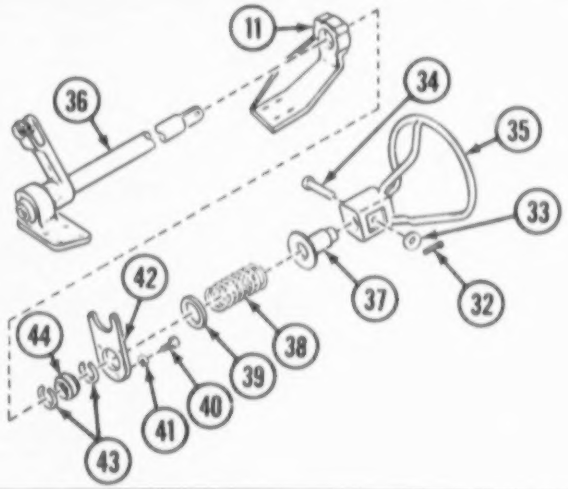
G Remove cotter pin (14), flat washer (15), pin (16) and swivel block (17). Discard cotter pin.

H Remove three screws (18), three lockwashers (19) and housing assembly with rod and levers (20) at bulkhead. Discard lockwashers.

I Remove three screws (21), three lockwashers (22) and adapter (23) at bulkhead. Discard lockwashers.

J Remove cotter pin (24), flat washer (25), bolt (26), flat washer (27), lever assembly (28), pin (29), rod assembly (30) and shaft (31). Discard cotter pin.

STEERING SHAFT ASSEMBLY: DISASSEMBLY



DISASSEMBLY

A Remove cotter pin (32), flat washers (33), pin (34) and steering wheel (35) from shaft (36). Discard cotter pin.

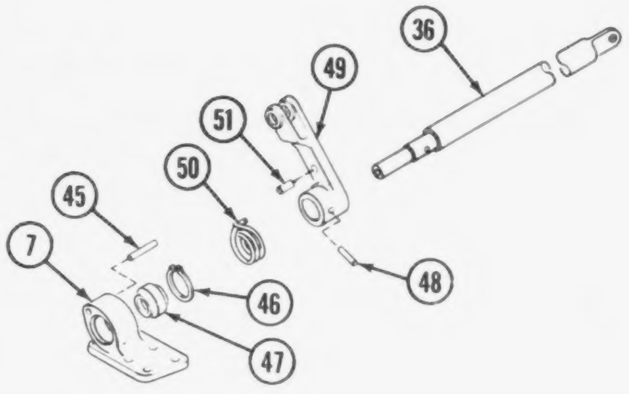
B Remove sleeve (37), spring (38) and washer (39) from shaft (36).

C Remove three screws (40), three lockwashers (41) and master warning light bracket (42) from bracket (11). Discard lockwashers.

D Remove two retaining rings (43), bearing (44) and bracket (11) from shaft (36). Discard retaining rings.

TA57681

STEERING SHAFT ASSEMBLY: DISASSEMBLY (CONTINUED)



E Remove bracket (7), with pin (45), retaining ring (46), and bearing (47) from shaft (36).

F Remove pin (48), lever (49) and spring (50) from shaft (36). Discard pin.

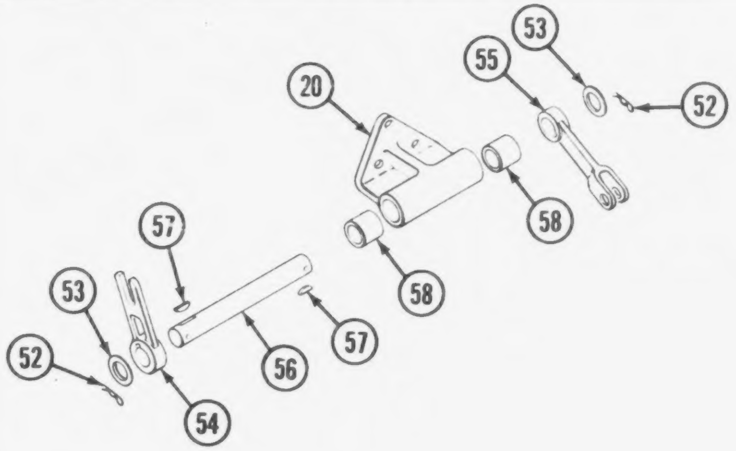
NOTE

Pin (51) holds spring (50) under tension.

G Remove pin (51) from lever (49).

H Remove pin (45), retaining ring (46), and bearing (47) from bracket (7).

HOUSING ASSEMBLY: DISASSEMBLY



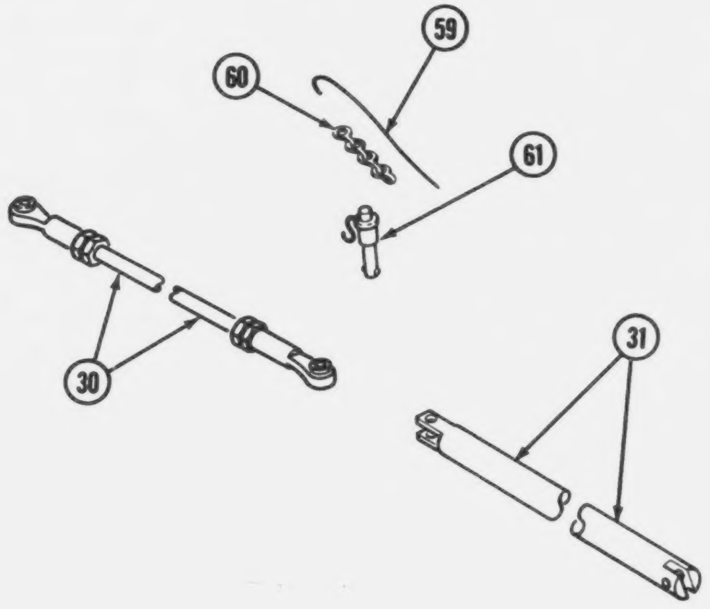
DISASSEMBLY

A Remove two cotter pins (52), two flat washers (53), lever (54) and lever (55) from shaft (56). Discard cotter pins.

B Remove shaft (56), two Woodruff keys (57) and two bearings (58) from housing (20).

TA57691

ROD ASSEMBLY AND SHAFT: DISASSEMBLY

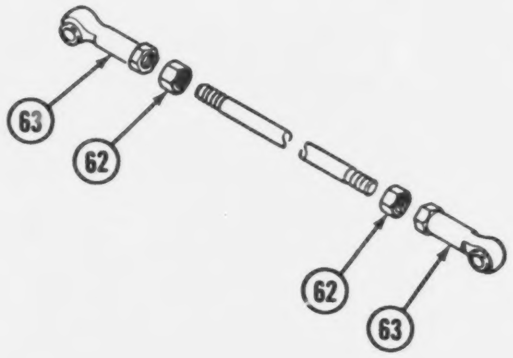


DISASSEMBLY

A Remove wire (59), chain (60) and quick-release pin (61).

B Separate rod assembly (30) and shaft (31).

ROD ASSEMBLIES: DISASSEMBLY



DISASSEMBLY

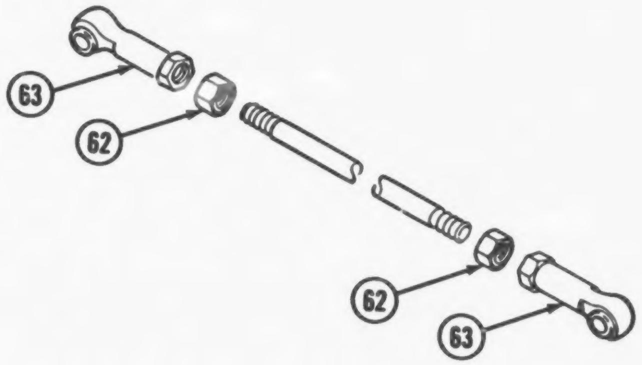
A Loosen two nuts (62), one at each end of rod.

B Unscrew two rod ends (63) from both ends of each rod.

C Unscrew two nuts (62) from each rod.

TA57701

ROD ASSEMBLIES: ASSEMBLY



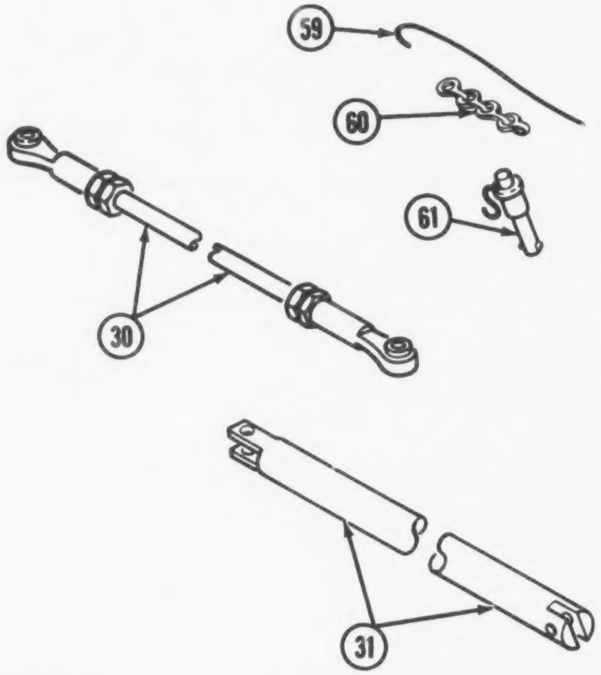
ASSEMBLY

A Install two nuts (62), one at each end of rod.

B Install two rod ends (63) on each rod.

C Tighten two nuts (62) on each rod.

ROD ASSEMBLY AND SHAFT: ASSEMBLY



ASSEMBLY

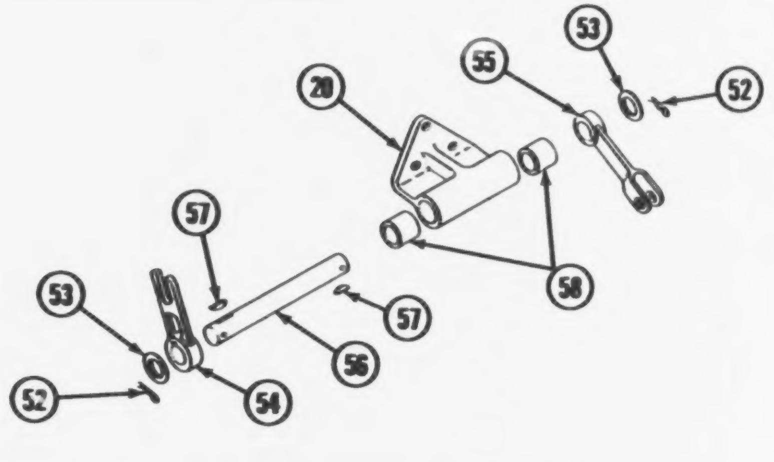
A Connect rod assembly (30) to shaft (31) using quick-release pin (61).

B Connect chain (60) to quick-release pin (61) using S-hook (part of 61).

C Secure free end of chain (60) to rod assembly (30) using wire (59).

TA58015

HOUSING ASSEMBLY: ASSEMBLY

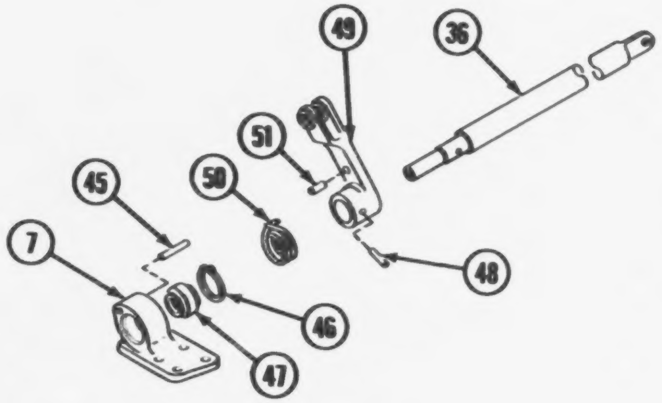


ASSEMBLY

A Install shaft (56), two Woodruff keys (57) and two bearings (58) in housing (20).

B Install lever (54) and lever (55) on shaft (56) with two new cotter pins (52) and two flat washers (53).

STEERING SHAFT ASSEMBLY: ASSEMBLY



ASSEMBLY

A Install pin (51) in lever (49).

NOTE

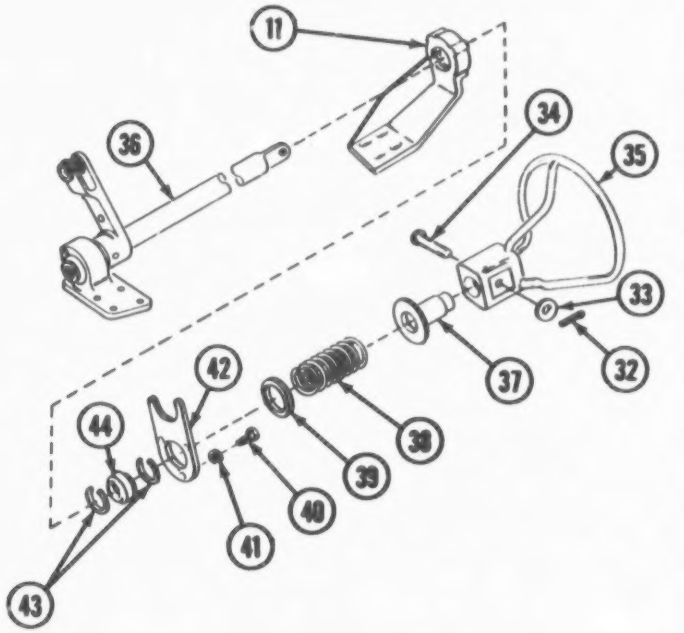
Pins (51 and 48) hold spring (50) under tension.

B Install new pin (48), lever (49) and spring (50) on shaft (36).

C Install pin (45), retaining ring (46), bearing (47) and shaft (36) into bracket (7).

TA58014

STEERING SHAFT ASSEMBLY: ASSEMBLY (CONTINUED)



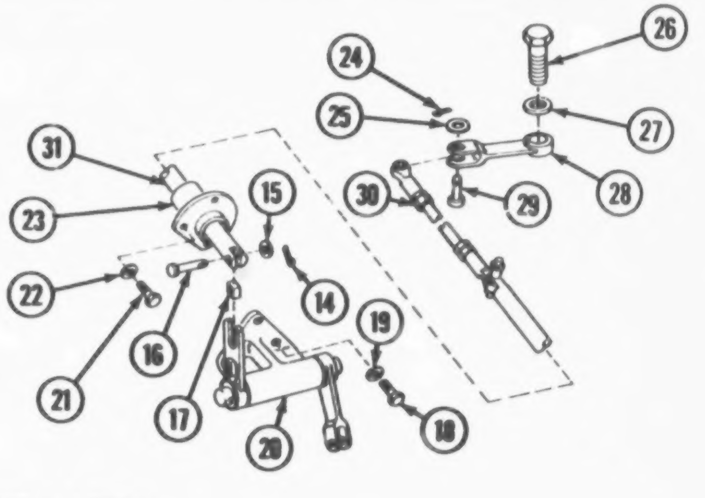
D Install bracket (11) on shaft (36) using two new retaining rings (43) and bearing (44).

E Install master warning light bracket (42) on bracket (11) using three screws (40) and three new lockwashers (41).

F Install sleeve (37), spring (38) and washer (39) on shaft (36).

G Install steering wheel (35) on shaft (36) using new cotter pin (32), flat washers (33), and pin (34).

STEERING CONTROL LINKAGE: INSTALLATION



INSTALLATION

A Install lever (28), flat washer (27) and bolt (26).

B Install rod assembly (30) and shaft (31) using new cotter pin (24), flat washer (25) and pin (29).

C Lubricate inside of adapter (23) with solid wax base lubricant (item 72, Appx D).

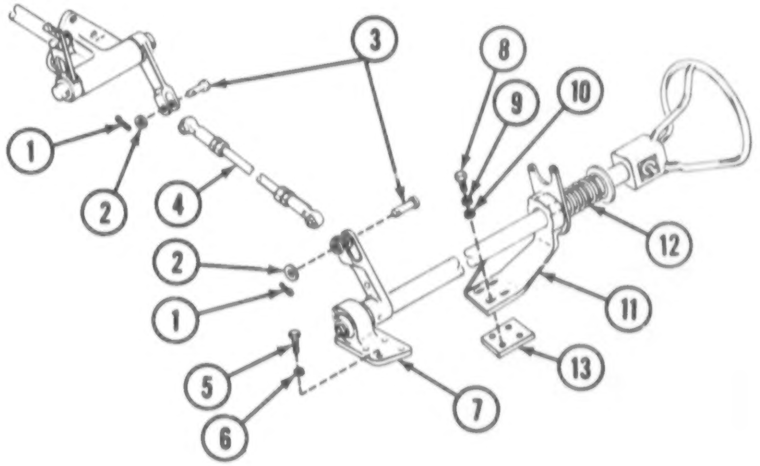
D Install adapter (23) at bulkhead using three screws (21) and three new lockwashers (22).

E Install housing assembly with rod and levers (20) to bulkhead using three screws (18) and three new lockwashers (19).

F Install swivel block (17) using new cotter pin (14), flat washer (15) and pin (16).

TA58011

STEERING CONTROL LINKAGE: INSTALLATION (CONTINUED)



G Position steering shaft assembly (12) with two brackets (7 and 11), and spacer (13) in driver's compartment.

H Install bracket (11) and spacer (13) using four screws (8), four new lockwashers (9) and four flat washers (10).

I Install bracket (7) using four screws (5) and four new lockwashers (6).

NOTE

Rod assembly (4) is connected between steering shaft and bulkhead-mounted housing.

J Install rod assembly (4) using two new cotter pins (1), two flat washers (2) and two pins (3).

K Install master warning light assembly on steering shaft mount (p 7-53).

L Adjust steering control linkage (p 7-44).

M Close transmission access doors.

TA58010

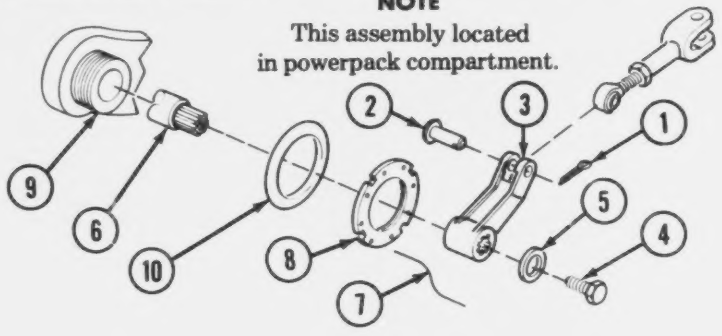
BRAKE ASSEMBLY IN DRIVER'S COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT

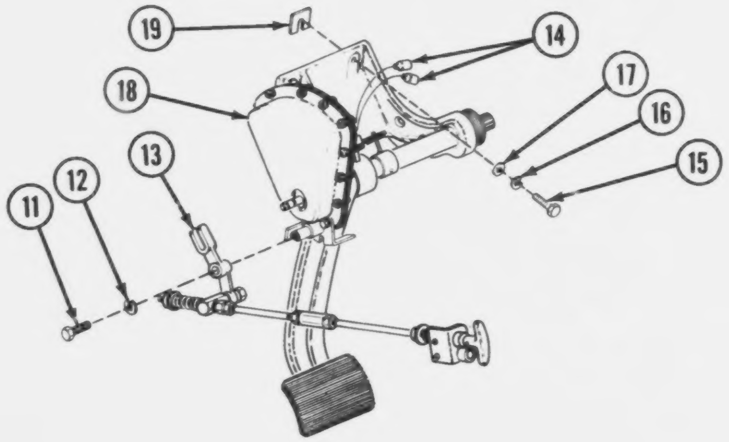
INITIAL SETUP

Equipment condition:
Vehicle tracks blocked.
Parking brake released.

NOTE

This assembly located in powerpack compartment.





REMOVAL

A Open transmission access doors.

B Remove cotter pin (1) and straight pin (2) from pull lever (3). Discard cotter pin.

C Remove screw (4), flat washer (5) and pull lever (3) from shaft (6).

D Remove and discard lockwire (7).

E Unscrew retainer plate (8) from end of support (9) and remove seal (10). Discard seal.

F Remove screw (11) and lockwasher (12) from parking brake (13). Discard lockwasher.

G Disconnect two electrical connectors (14) at brake warning light switch.

H Remove four screws (15), four lockwashers (16) and four flat washers (17) at driver's bulkhead. Discard lockwashers.

NOTE

Note number and location of shims to ensure proper installation.

I Remove brake assembly (18) and shims (19) from driver's compartment.

TA57214

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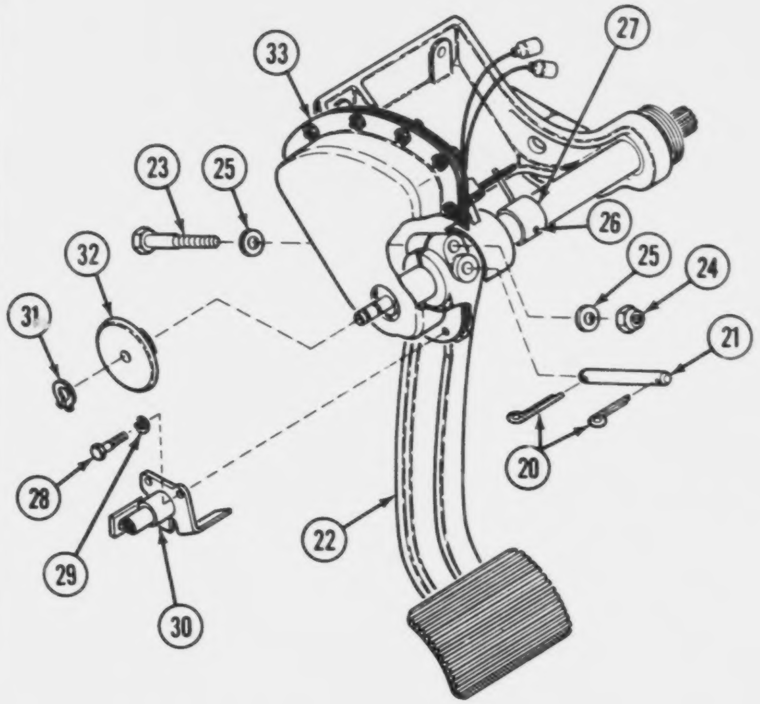
BRAKE ASSEMBLY IN DRIVER'S COMPARTMENT: REMOVAL, DISASSSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



DISASSEMBLY

NOTE

Pin must be driven out from top.

A Remove two cotter pins (20) and pin (21) at brake pedal (22). Discard cotter pins.

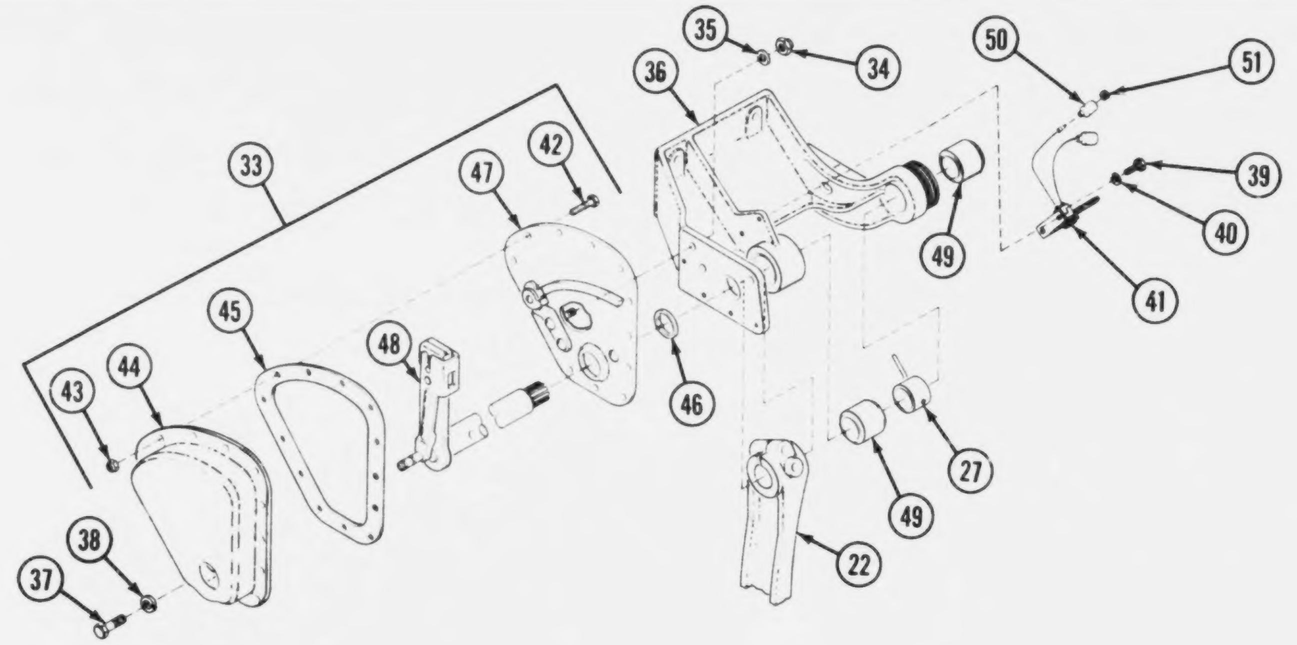
B Remove screw (23), locknut (24) and two flat washers (25) at brake pedal (22). Discard locknut.

C Loosen two setscrews (26) at actuator (27).

D Remove two screws (28), two lockwashers (29), mounting bracket (30), lockring (31) and boot (32) at parking brake latch assembly (33). Discard lockwashers, lockring and boot.

TA312835

BRAKE ASSEMBLY IN DRIVER'S COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



E Remove three locknuts (34) and three flat washers (35) at support bracket (36). Discard locknuts.

F Remove two screws (37) and two lockwashers (38). Discard lockwashers.

G Remove parking brake latch assembly (33) by withdrawing from support bracket (36) to release actuator (27) and brake pedal (22).

H Remove two screws (39), two lockwashers (40) and bracket with stoplight switch (41) from support bracket (36). Discard lockwashers.

I Remove 10 screws (42), 10 locknuts (43), cover (44), gasket (45) and seal (46) from bracket assembly (47). Discard locknuts, gasket and seal.

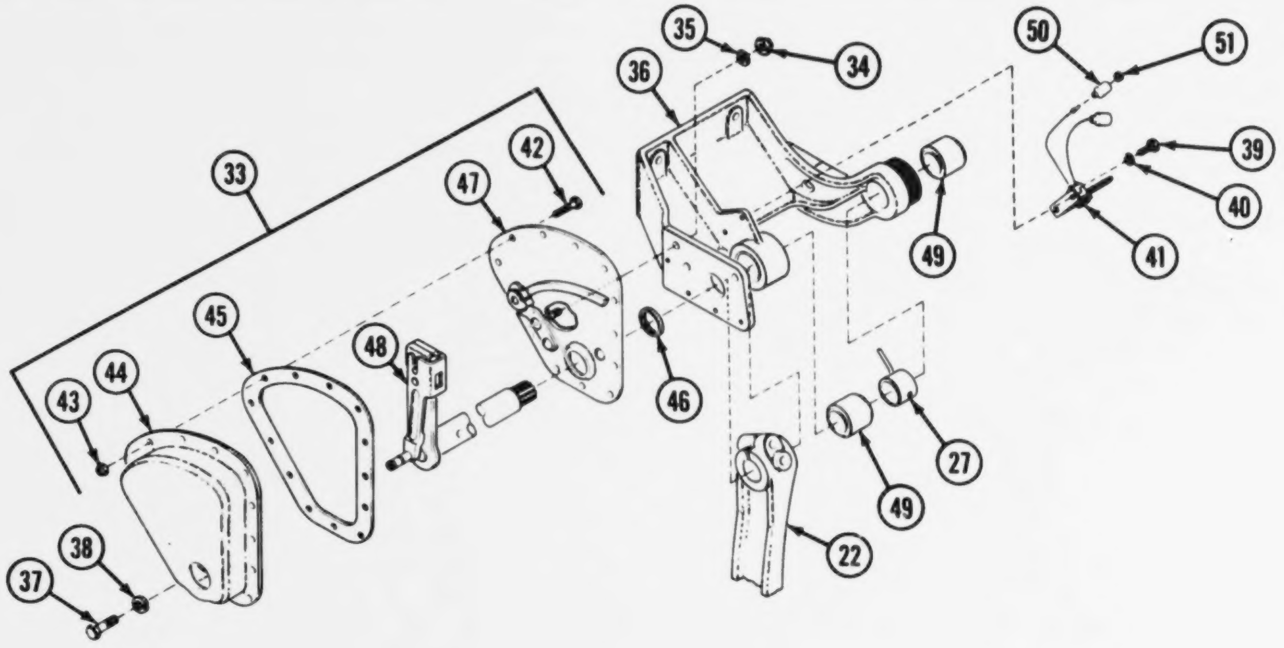
J Remove latch (48) from bracket assembly (47).

K Inspect two bearings (49) for nicks or burrs. Remove bearings if damaged.

L Remove two shells (50) and two slotted washers (51).

TA57215

BRAKE ASSEMBLY IN DRIVER'S COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



ASSEMBLY

A Install two slotted washers (51) and two shells (50) on stoplight switch (41).

B Install two new bearings (49) if necessary.

C Position latch (48) on bracket assembly (47).

D Install new seal (46) on shaft end of latch (48).

E Install new gasket (45) and cover (44) on bracket assembly (47) with 10 screws (42) and 10 new locknuts (43).

F Install two screws (37) and two new lockwashers (38) in cover (44).

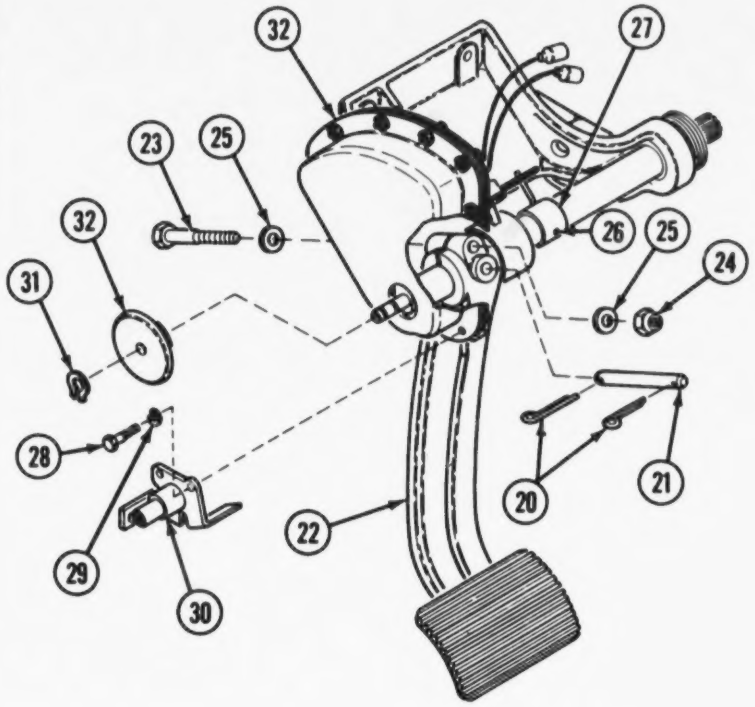
G Install bracket with stoplight switch (41) on support bracket (36) with two screws (39) and two new lockwashers (40).

H Position parking brake latch assembly (33) on support bracket (36), brake pedal (22) and actuator (27).

I Install three new locknuts (34) and three flat washers (35) at support bracket (36).

TA57216

BRAKE ASSEMBLY IN DRIVER'S COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



J Install new boot (32) with new lockring (31).

K Install mounting bracket (30), two screws (28) and two new lockwashers (29).

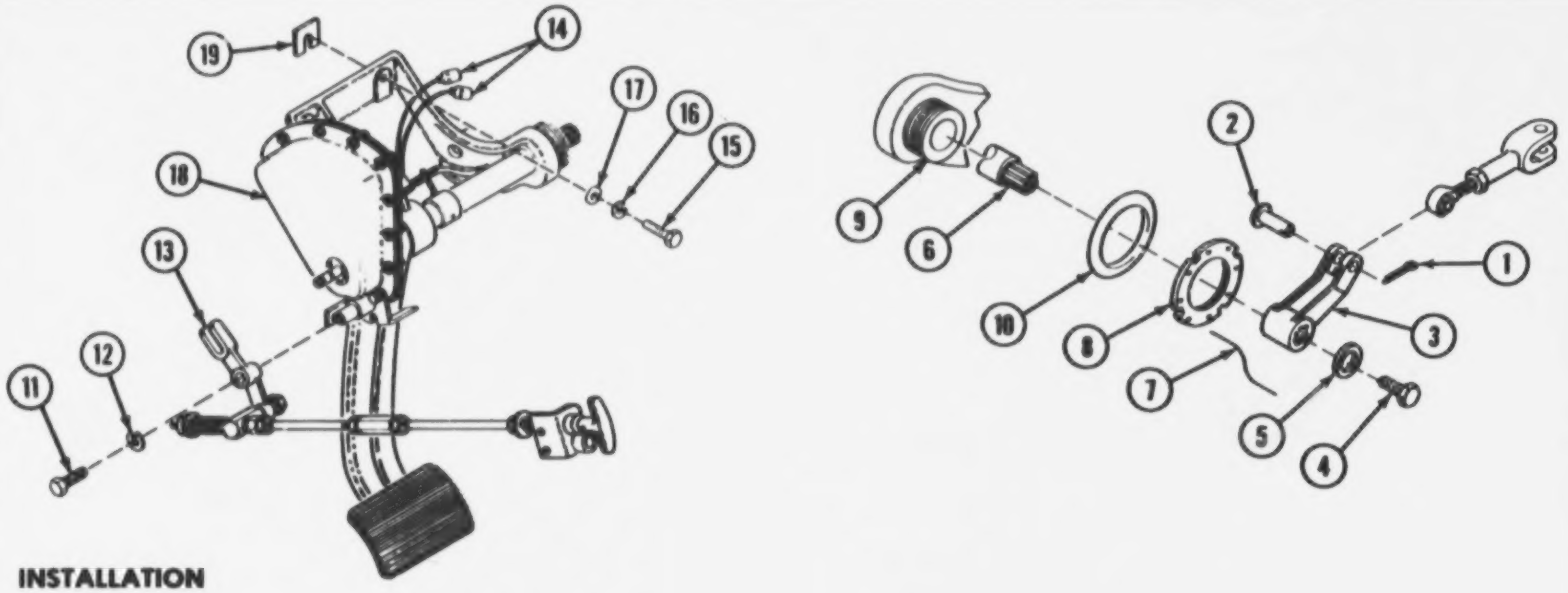
L Tighten two setscrews (26) on actuator (27).

M Install screw (23), flat washers (25) and new locknut (24) on brake pedal (22).

N Install pin (21) on brake pedal (22) with two new cotter pins (20).

TA57217

BRAKE ASSEMBLY IN DRIVER'S COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



INSTALLATION

A Install brake assembly (18) with shims (19) as required, four screws (15), four new lockwashers (16) and four flat washers (17).

B Connect two electrical connectors (14) to brake warning light switch.

C Install parking brake (13) with screw (11) and new lockwasher (12).

D Position new seal (10) on support (9) and screw on retainer plate (8).

E Install new lockwire (7).

F Install pull lever (3) on end of shaft (6) with screw (4) and flat washer (5).

G Install straight pin (2) in pull lever (3) with new cotter pin (1).

H Close transmission access doors.

ADJUSTMENT

Refer to p 7-40 for instructions on adjustment of brake after installation.

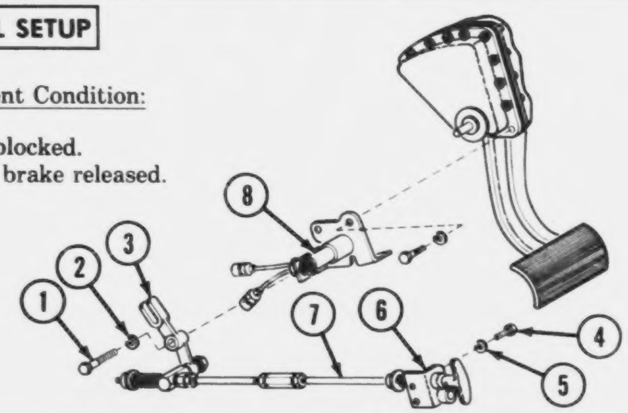
TA57218

SERVICE AND PARKING BRAKE LINKAGE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Vehicle blocked.
Parking brake released.



REMOVAL

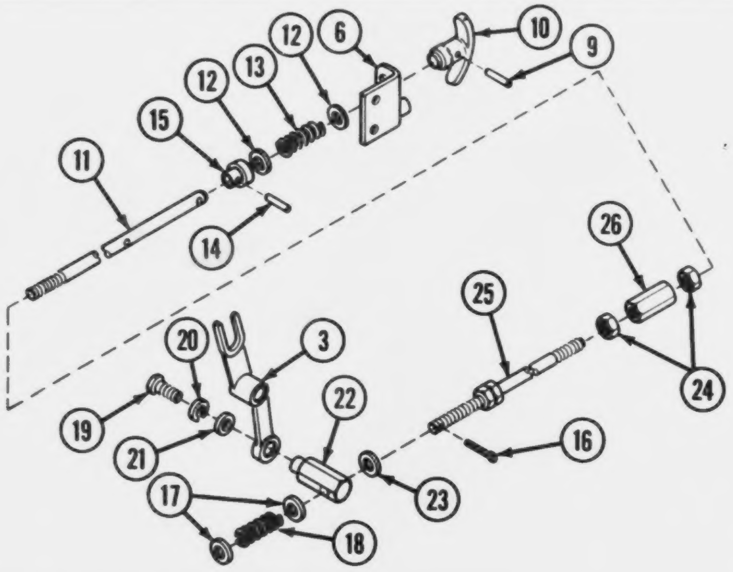
A Remove screw (1) and lockwasher (2) from bell crank (3). Discard lockwasher.

B Remove two screws (4) and two lockwashers (5) from bracket (6). Discard lockwashers.

NOTE

Support parking brake linkage by hand.

C Remove parking brake linkage assembly (7). Pull bell crank (3) off bracket spindle (8).



DISASSEMBLY

A Remove pin (9) and handle (10) from end of rod (11). Discard pin.

B Remove mounting bracket (6), two flat washers (12) and spring (13). Discard spring.

C Remove pin (14) and collar (15). Discard pin.

D Remove cotter pin (16), two flat washers (17) and spring (18). Discard cotter pin and spring.

E Remove screw (19), lockwasher (20), flat washer (21), bell crank (3) and rod guide (22). Discard lockwasher.

F Remove flat washer (23).

NOTE

Removal of nuts from rods is not necessary.

G Loosen two nuts (24). Loosen and unscrew rods (11 and 25) from nut (26).

TA312840

SERVICE AND PARKING BRAKE LINKAGE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

ASSEMBLY

A Make sure nuts (24) are screwed on rods (11 and 25).

B Screw rods (11 and 25) into nut (26) and tighten two nuts (24).

C Install flat washer (23), rod guide (22), two flat washers (17) and new spring (18) on end of rod (25).

D Install new cotter pin (16) in end of rod (25).

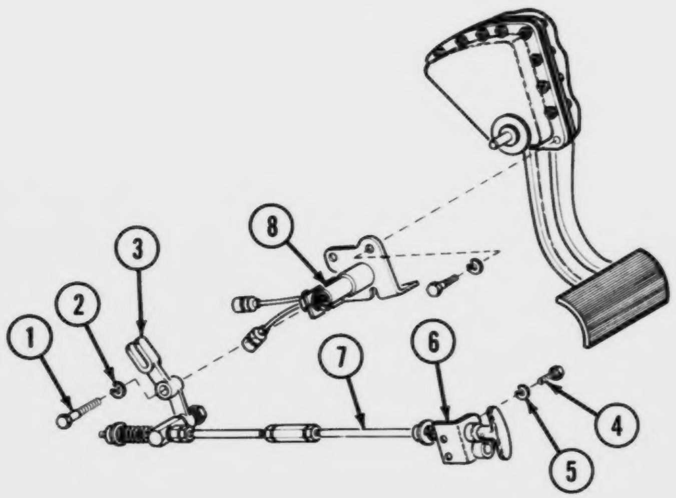
E Install bell crank (3) on rod guide (22) with flat washer (21), new lockwasher (20) and screw (19).

F Install collar (15) on end of rod (11) with new pin (14).

G Position two flat washers (12), new spring (13) and bracket (6) on rod (11).

H Install handle (10) on end of rod (11) with new pin (9).

I Install brake linkage (p 7-17).



INSTALLATION

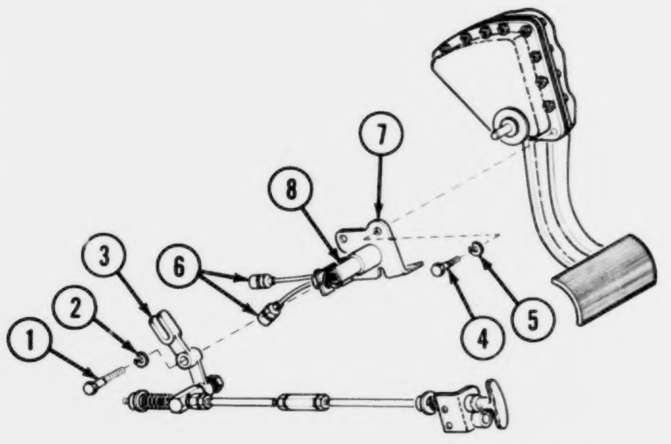
A Position parking brake linkage assembly (7) and install bell crank (3) on bracket spindle (8).

B Install screw (1) and new lockwasher (2).

C Secure bracket (6) with two screws (4) and two new lockwashers (5).

TA312841

PARKING BRAKE LIGHT SWITCH AND BRACKET: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



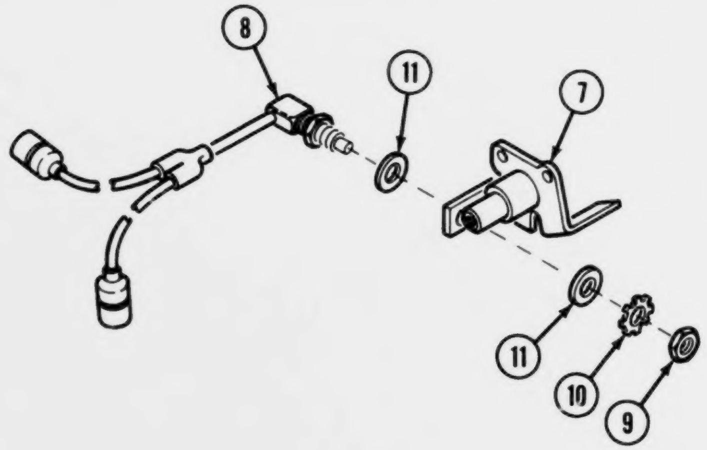
REMOVAL

A Remove screw (1) and lockwasher (2) from bell crank (3). Discard lockwasher.

B Remove two screws (4) and two lockwashers (5). Discard lockwashers.

C Disconnect electrical connectors (6).

D Remove bracket (7) with light switch (8).



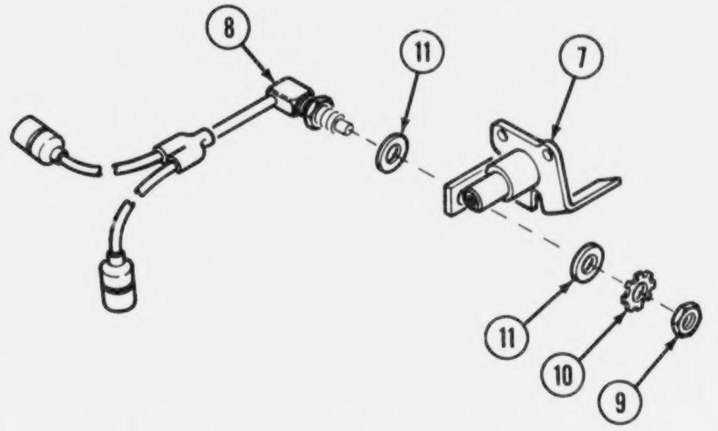
DISASSEMBLY

A Unscrew nut (9), lockwasher (10) and two flat washers (11) from parking brake light switch (8). Discard lockwasher.

B Separate parking brake light switch (8) and bracket (7).

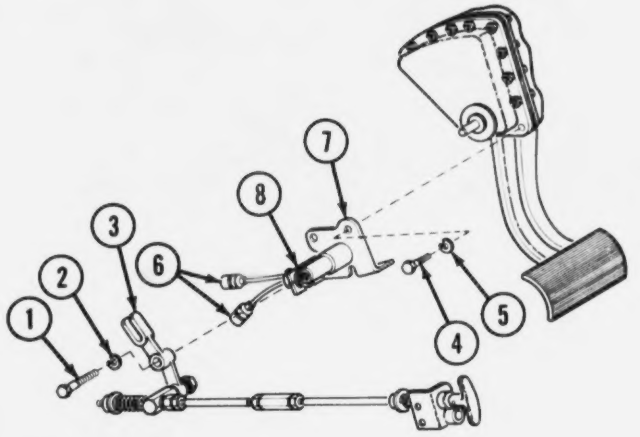
TA312842

PARKING BRAKE LIGHT SWITCH AND BRACKET: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

Install parking brake light switch (8) on bracket (7) with nut (9), new lockwasher (10) and two flat washers (11).



INSTALLATION

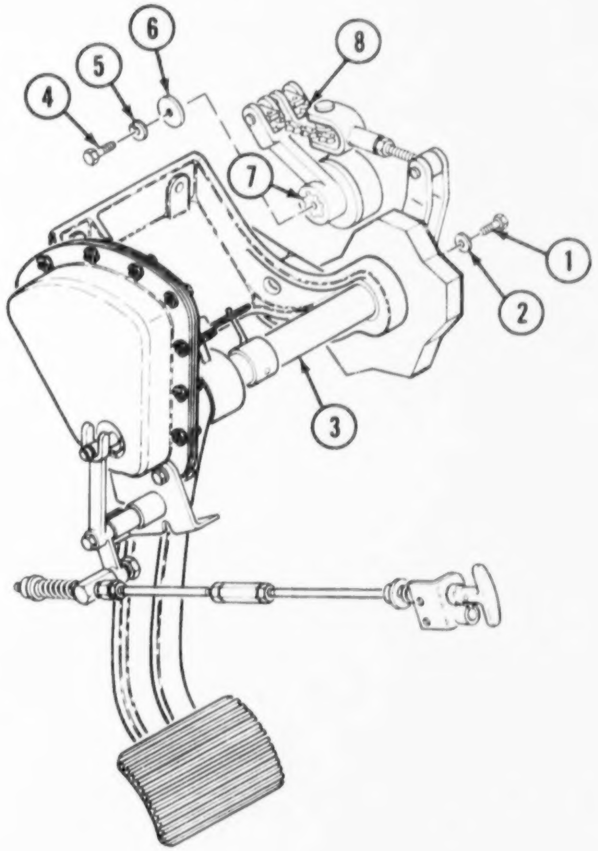
A Install bracket (7) with light switch (8) with two screws (4) and two new lockwashers (5).

B Install bell crank (3) on bracket (7) with screw (1) and new lockwasher (2).

C Connect electrical connectors (6).

TA312843

LINKAGE IN POWERPACK COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT



REMOVAL

A Open transmission access doors.

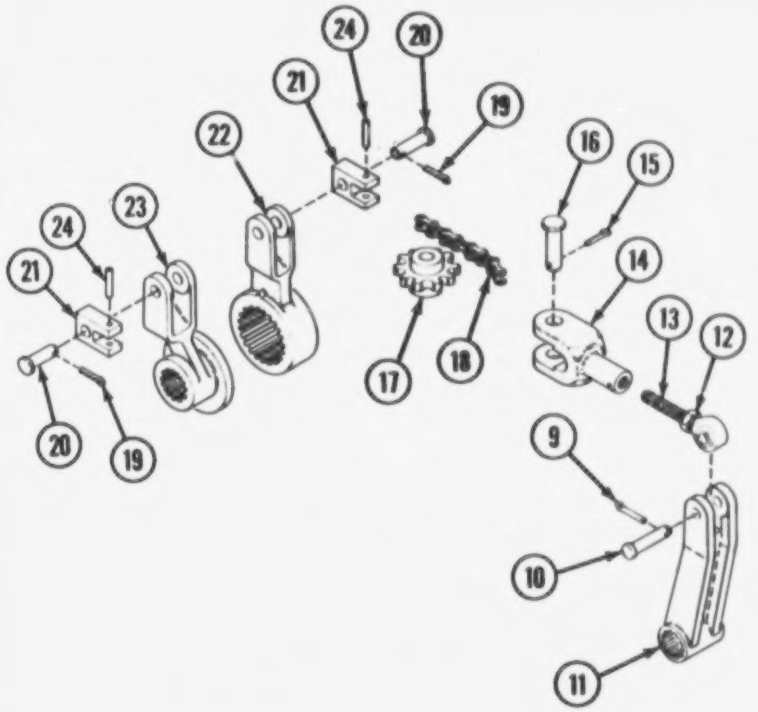
B Remove screw (1) and flat washer (2) from shaft (3).

C Remove screw (4), lockwasher (5) and flat washer (6) from shaft (7). Discard lockwasher.

D Remove linkage (8) from shafts (3 and 7).

TA58088

LINKAGE IN POWERPACK COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



DISASSEMBLY

A Remove cotter pin (9) and pin (10) from lever (11). Discard cotter pin.

B Loosen nut (12) on rod end (13).

C Unscrew and remove rod (13) from clevis (14).

D Remove cotter pin (15) and discard.

E Remove pin (16) and sprocket (17) with chain (18) from clevis (14).

F Remove two cotter pins (19), two pins (20) and two clevises (21) with chain (18) from right brake lever (22) and left brake lever (23). Discard cotter pins.

G Remove two pins (24) and separate chain (18) from clevises (21). Discard pins.

ASSEMBLY

A Install two clevises (21) on ends of chain (18) with two new pins (24).

B Position chain (18) with clevises (21) on sprocket (17).

C Install clevises (21) in right brake lever (22) and left brake lever (23) with two pins (20) and two new cotter pins (19).

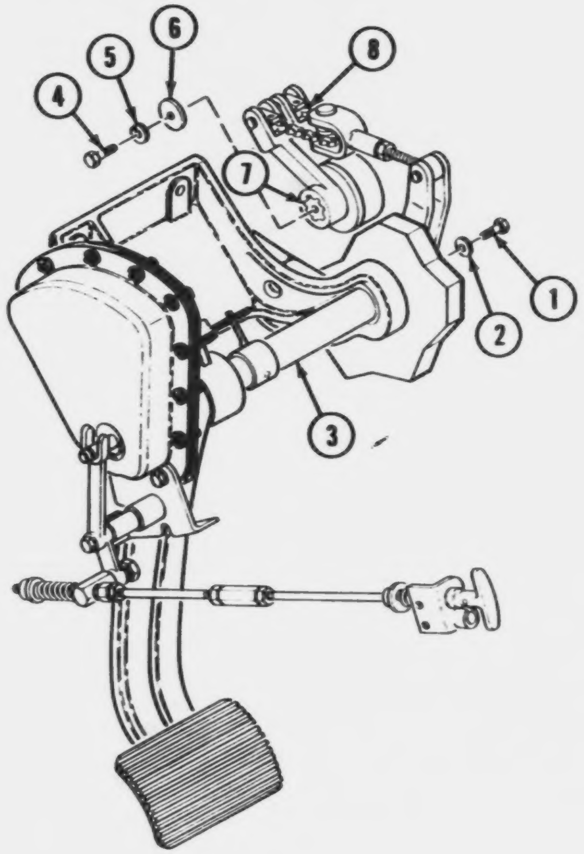
D Install clevis (14) on sprocket (17) with pin (16) and new cotter pin (15).

E Screw rod end (13) into clevis (14) and tighten nut (12).

F Install lever (11) on rod end (13) with pin (10) and new cotter pin (9).

TA312845

LINKAGE IN POWERPACK COMPARTMENT: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



INSTALLATION

A Position linkage (8) on shafts (3 and 7).

B Install screw (4), new lockwasher (5) and flat washer (6) on shaft (7).

C Install screw (1) and flat washer (2) on shaft (3).

D Close transmission access doors.

ADJUSTMENT

Refer to p 7-40 for instructions on adjustment of service and parking brakes after installation. Brakes must be adjusted after installation to ensure proper operation.

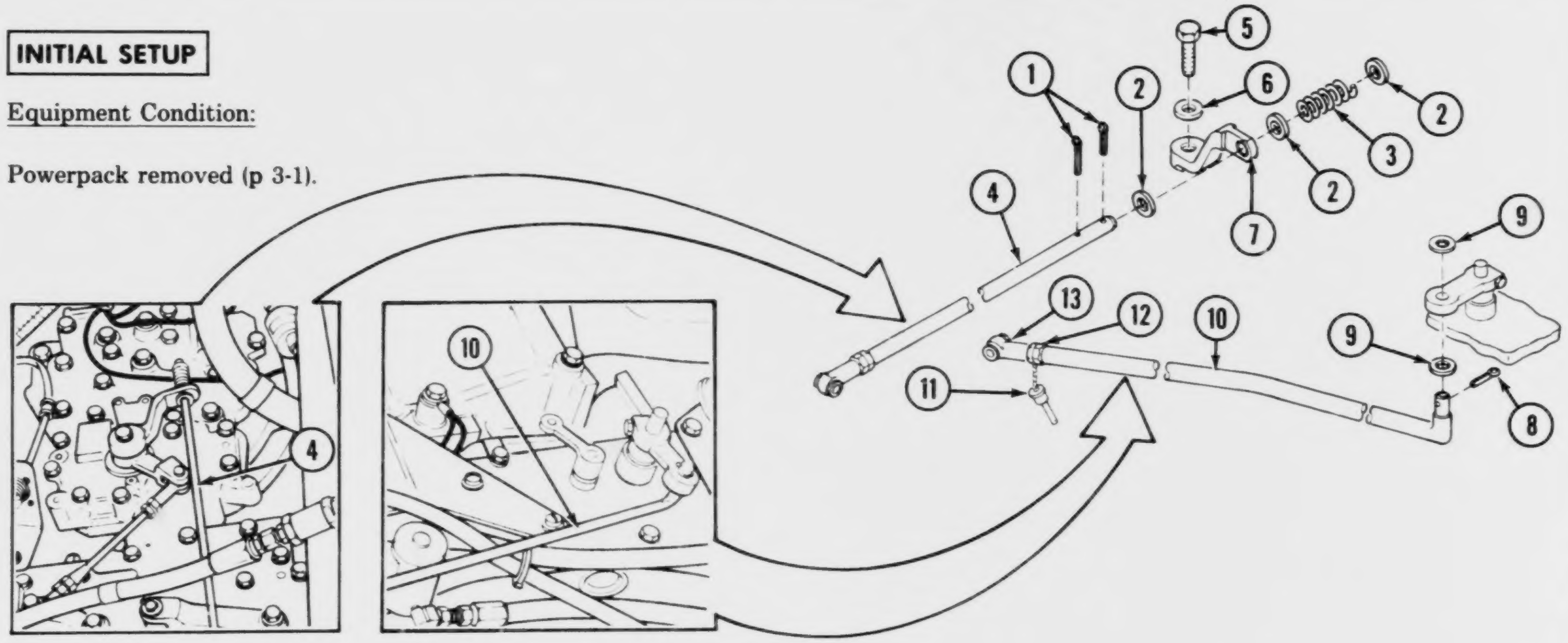
TA58097

ACCELERATOR, THROTTLE AND ENGINE CONTROL GOVERNOR: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Powerpack removed (p 3-1).



REMOVAL

A Remove two cotter pins (1), three flat washers (2), spring (3) and rod assembly (4). Discard cotter pins.

NOTE

- Remove throttle control lever (7) only if damaged or requiring replacement
- If bolt (5) is lost or damaged, notify support maintenance.

B Remove bolt (5), flat washer (6), and throttle control lever (7) at transmission. Replace bolt (5) and flat washer (6).

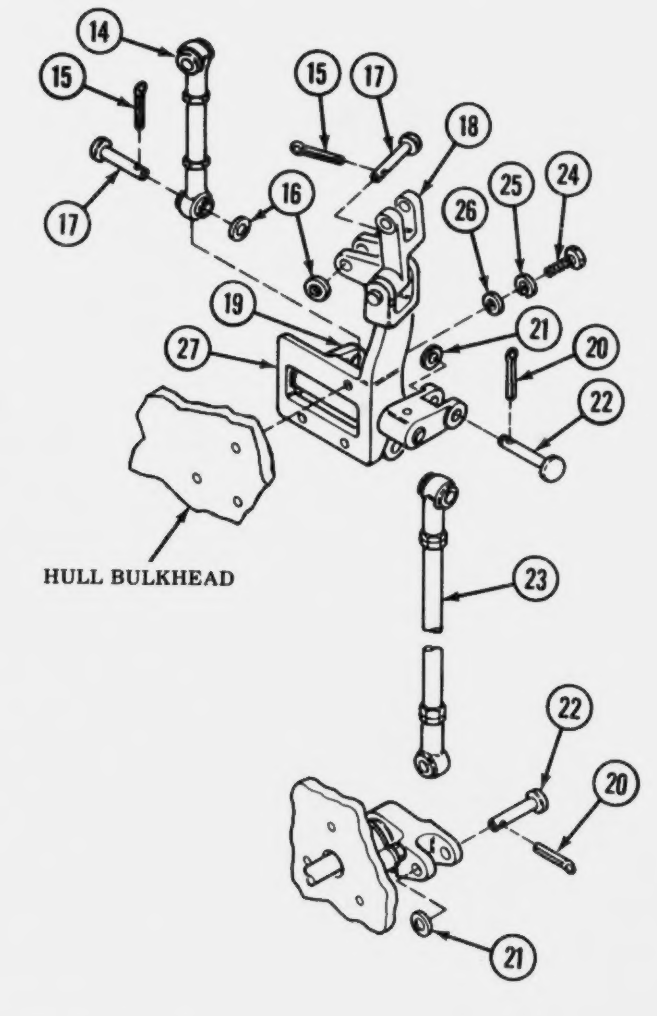
C Remove cotter pin (8) and two flat washers (9) at engine throttle control lever end of connecting link (10). Discard cotter pin.

D Loosen nut (12) and remove end (13) and nut (12).

E Remove quick-release pin (11), chain, and wire.

TA57219

ACCELERATOR, THROTTLE AND ENGINE CONTROL GOVERNOR: REMOVAL AND INSTALLATION (CONTINUED)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HULL BULKHEAD
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21

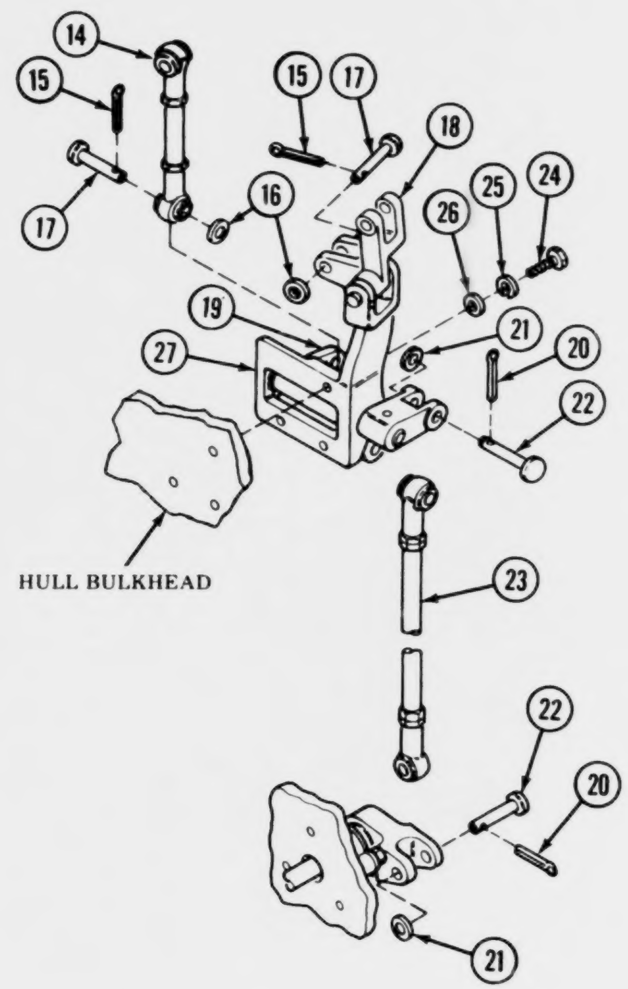
F Remove rod assembly (14) by removing two cotter pins (15), two flat washers (16) and two pins (17) at bell crank (18) and bell crank (19). Discard cotter pins.

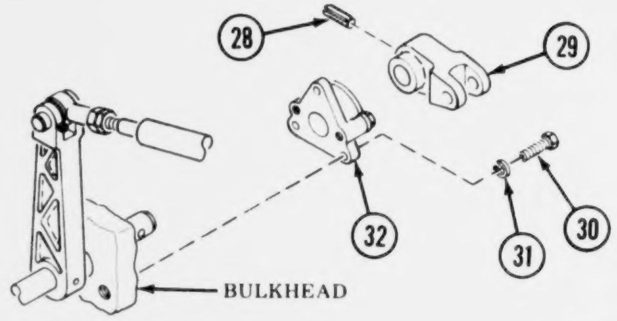
G Remove two cotter pins (20), two flat washers (21), two pins (22) and rod assembly (23). Discard cotter pins.

H Remove three screws (24), three lockwashers (25), three flat washers (26) and bracket assembly (27) from hull bulkhead. Discard lockwashers.

TA57220

ACCELERATOR, THROTTLE AND ENGINE CONTROL GOVERNOR: REMOVAL AND INSTALLATION (CONTINUED)





I Remove spring pin (28) and lever (29). Use drive pin punch and hammer to remove pin (28).

J Remove three screws (30) and three lockwashers (31) at accelerator shaft support bracket assembly (32). Discard lockwashers.

K Remove accelerator shaft support bracket assembly (32) from bulkhead.

INSTALLATION

A Install accelerator shaft support bracket assembly (32) on bulkhead with three screws (30) and three new lockwashers (31).

B Install lever (29) and spring pin (28).

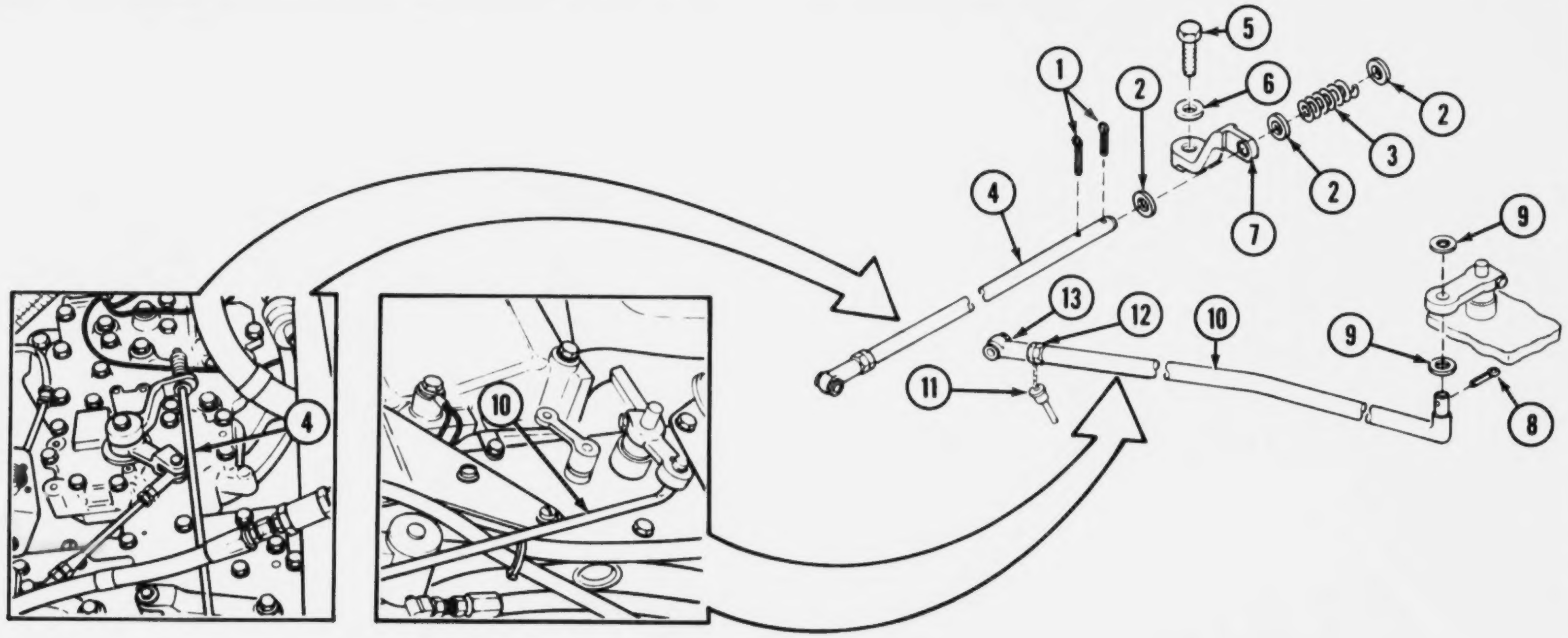
C Install bracket assembly (27) on hull bulkhead with three screws (24), three new lockwashers (25) and three flat washers (26).

D Install rod assembly (23) with two pins (22), two flat washers (21) and two new cotter pins (20).

E Install rod assembly (14) at bell crank (19) and bell crank (18) with two pins (17), two flat washers (16) and two new cotter pins (15).

TA57221

ACCELERATED, THROTTLE AND ENGINE CONTROL GOVERNOR: REMOVAL AND INSTALLATION (CONTINUED)



F Install quick-release pin (11), chain and wire to connecting link (10).

G Install nut (12) and rod end (13) to connecting link (10).

H Install engine throttle control lever end of connecting link (10) with two flat washers (9) and new cotter pin (8).

I Remove bolt (5) and flat washer (6). Install throttle control lever (7), flat washer (6), and bolt (5), at transmission.

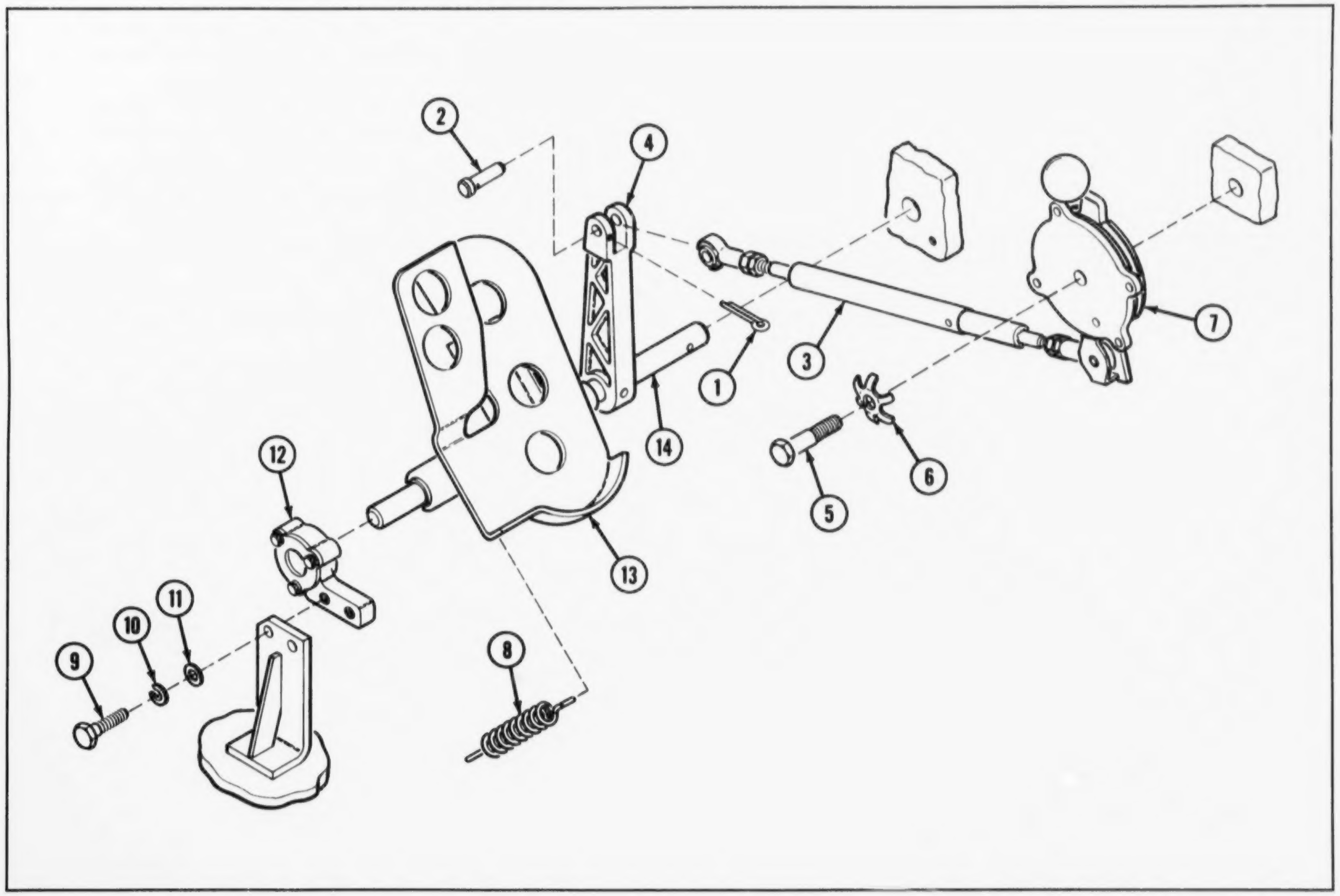
J Install rod assembly (4) and spring (3) with three flat washers (2) and two new cotter pins (1).

ADJUSTMENT

Refer to pages 7-46 through 7-49 for instructions on adjustment of accelerator, throttle and engine control governor after installation.

TA57222

THROTTLE CONTROL LEVER AND ACCELERATOR PEDAL: REMOVAL AND INSTALLATION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8

TA312851

THROTTLE CONTROL AND ACCELERATOR PEDAL: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

Throttle control rod is part of hand throttle control assembly.

A Remove cotter pin (1) and pin (2) at end of throttle control rod (3) at lever (4). Discard cotter pin.

B Remove screw (5), key washer (6), and hand throttle control assembly (7) from driver's bulkhead.

C Remove spring (8) at pedal.

D Remove two screws (9), two lockwashers (10) and two flat washers (11) at support bracket (12). Discard lockwashers.

NOTE

Lift pedal assembly until support bracket clears mounting bracket and remove from bulkhead.

E Remove pedal (13), lever (4) and shaft (14) from bulkhead as an assembly.

INSTALLATION

A Install pedal (13), lever (4) and shaft (14) in bulkhead as an assembly.

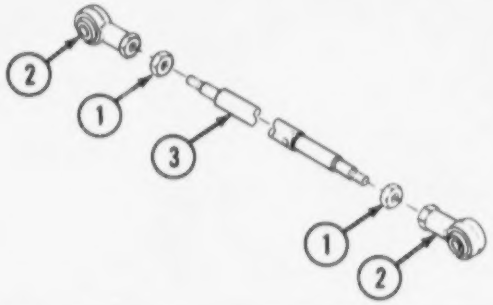
B Install support bracket (12) with two screws (9), two new lockwashers (10) and two flat washers (11).

C Install spring (8).

D Install hand throttle control assembly (7) at driver's bulkhead with key washer (6) and screw (5).

E Install throttle control rod (3) at lever (4) with pin (2) and new cotter pin (1).

ROD ASSEMBLIES: DISASSEMBLY



DISASSEMBLY

A Loosen locknut (1).

B Unscrew rod ends (2) from shaft (3).

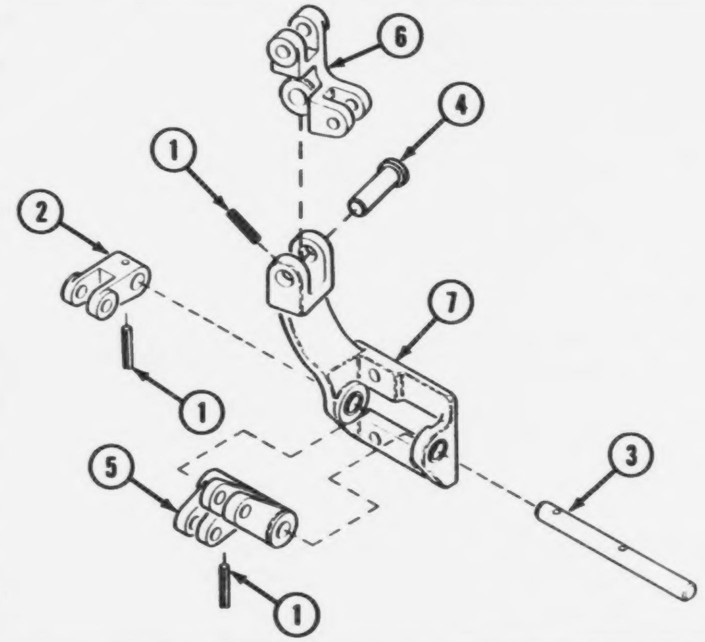
C Unscrew locknut (1) from shaft (3).

ASSEMBLY

Reverse disassembly procedures.

TA312853

BRACKET ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove three spring pins (1) using drive pin punch and hammer. Discard spring pins.

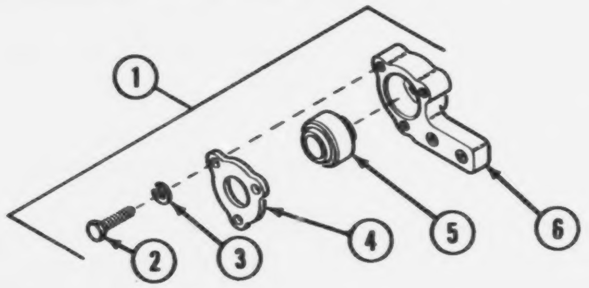
B Remove lever (2), pin (3), pin (4) and bell cranks (5 and 6) from bracket (7).

ASSEMBLY

A Install bell cranks (5 and 6), pin (4), pin (3) and lever (2) on bracket (7).

B Install three new spring pins (1).

BRACKET SUPPORT ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove bracket support assembly (1) from accelerator pedal shaft.

B Remove three screws (2) and three lockwashers (3).

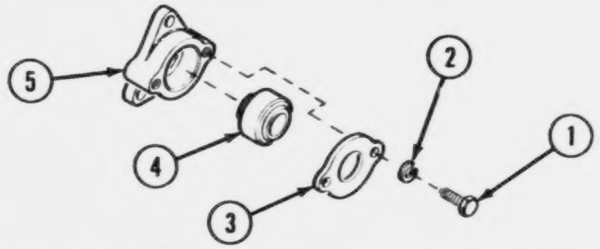
C Remove cap (4) and bearing (5) from bracket (6).

ASSEMBLY

Reverse disassembly procedure.

TA312854

BRACKET SUPPORT ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove two screws (1) and two lockwashers (2).

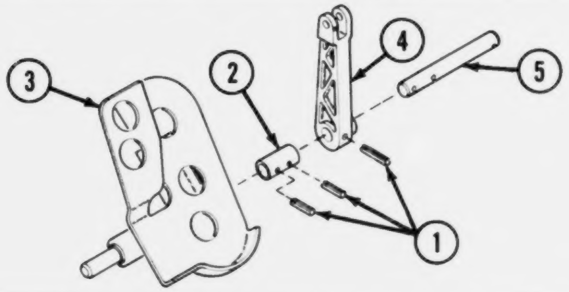
B Remove cap (3) and bearing (4) from bracket (5).

ASSEMBLY

Reverse disassembly procedure.

TA312855

PEDAL AND SHAFT ASSEMBLY: DISASSEMBLY AND ASSEMBLY



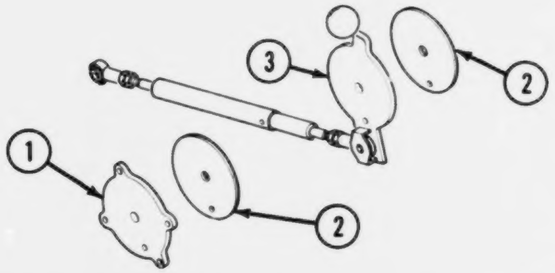
DISASSEMBLY

Remove three spring pins (1), collar (2), pedal (3) and lever (4) from shaft (5). Use drive pin punch and hammer to remove spring pins (1). Discard spring pins.

ASSEMBLY

Install lever (4), pedal (3), collar (2) and three new spring pins (1) on shaft (5).

HAND THROTTLE CONTROL ASSEMBLY: DISASSEMBLY AND ASSEMBLY



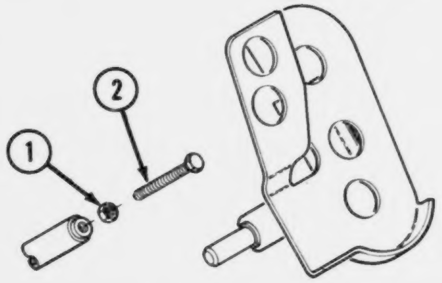
DISASSEMBLY

Separate cover (1), two disks (2) and lever rod assembly (3).

ASSEMBLY

Reverse disassembly procedure.

PEDAL STOP: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Loosen locknut (1).

B Remove screw (2) and locknut (1) from support.

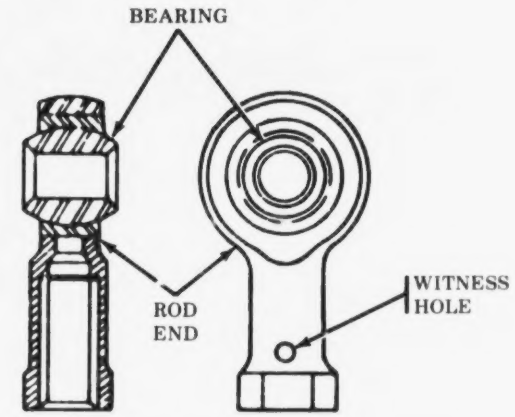
C Unscrew locknut (1) from screw (2).

ASSEMBLY

Reverse disassembly procedure.

TA312856

Section II TRANSMISSION, TRANSFER AND DRIVE CONTROL ASSEMBLIES — ADJUSTMENT

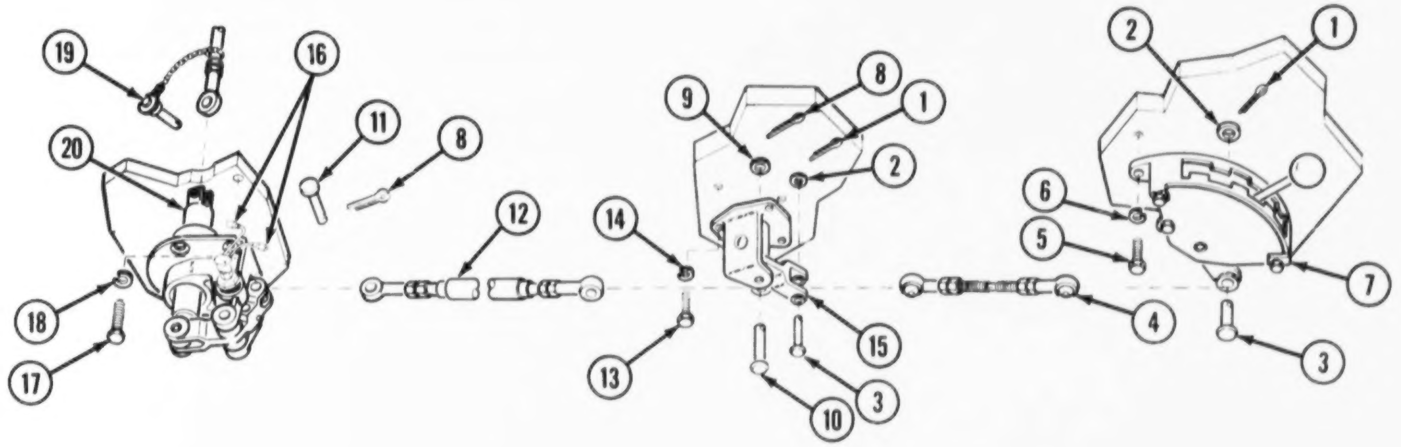


TYPICAL ROD END WITH BEARING

Rod end bearings used on various control linkages are of similar design and construction. For replacement of rod end bearings on any of the linkages, refer to illustration to the left. Inspect rod ends during adjustment procedures. Replace damaged or defective rod ends. Make sure witness hole is closed, after adjustment is completed, by trying to insert a small piece of wire into the hole.

TA310118

SHIFT CONTROL LINKAGE: REMOVAL AND INSTALLATION



REMOVAL

A Open and secure both transmission doors and air intake grille.

B Remove two cotter pins (1), two flat washers (2) and two pins (3) to release rod assembly (4). Remove rod assembly (4). Discard cotter pins.

C Remove three screws (5) and three lockwashers (6) to release quadrant assembly (7). Discard lockwashers.

D Remove two cotter pins (8), flat washer (9) and two pins (10 and 11) to release rod assembly (12). Remove rod assembly (12). Discard cotter pins.

E Remove three screws (13) and three lockwashers (14) to release support assembly (15). Remove support assembly (15). Discard lockwashers.

F Disconnect two push switch electrical leads (16).

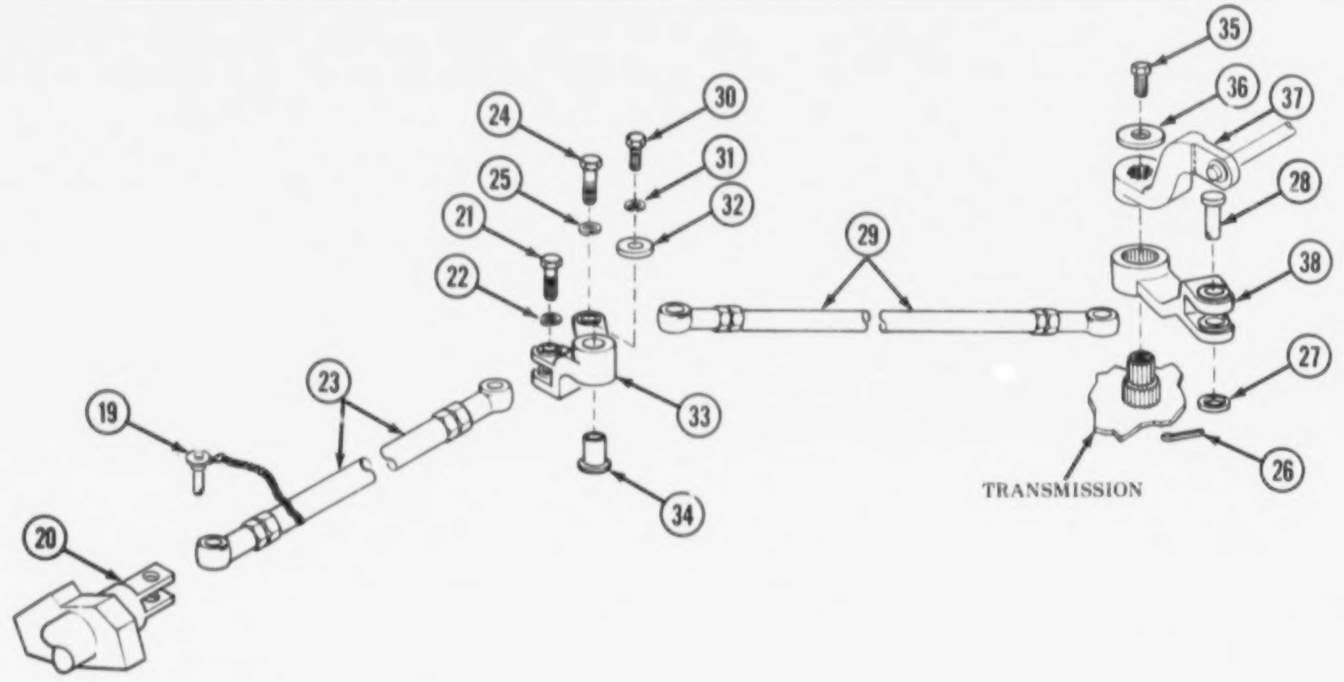
NOTE

Quick-release pin is located in powerpack compartment at the bulkhead.

G Remove four screws (17), four lockwashers (18) and quick-release pin (19) to release base assembly with shaft (20). Remove base assembly with shaft (20). Discard lockwashers.

TA312857

SHIFT CONTROL LINKAGE: REMOVAL AND INSTALLATION (CONTINUED)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TRANSMISSION
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H Remove screw (21) and lockwasher (22) to release rod assembly (23). Remove rod assembly (23). Discard lockwasher.

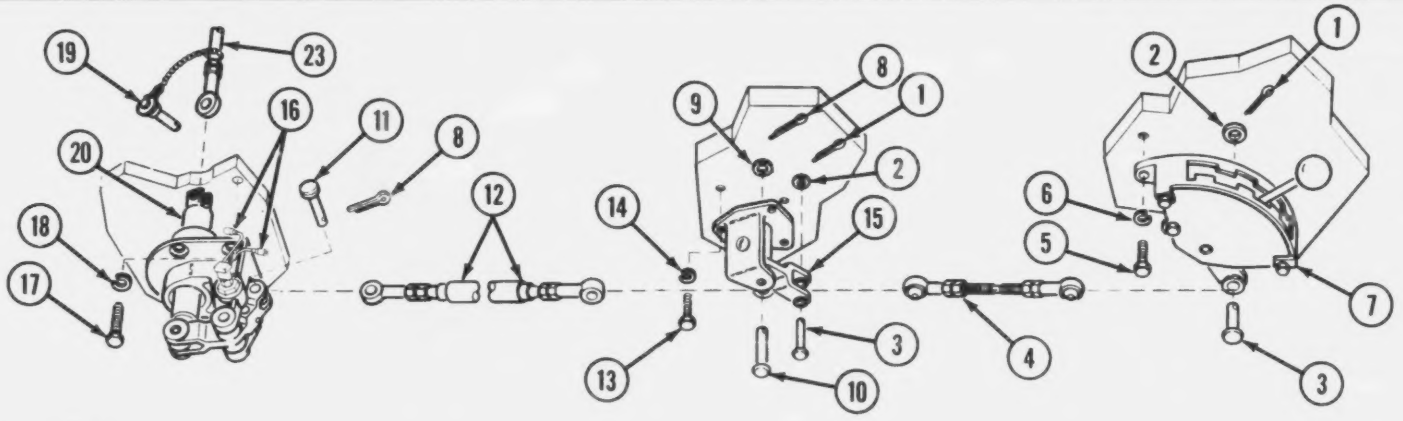
I Remove screw (24), lockwasher (25), cotter pin (26), flat washer (27) and pin (28) to release rod assembly (29). Remove rod assembly (29). Discard lockwasher and cotter pin.

J Remove screw (30), lockwasher (31), flat washer (32), bell crank (33) and spacer (34) at transmission. Discard lockwasher.

K Remove screw (35), flat washer (36) and throttle control lever (37) to release lever (38). Remove lever (38).

TA312858

SHIFT CONTROL LINKAGE: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install lever (38) and throttle control lever (37) and secure with flat washer (36) and screw (35).

B Install spacer (34) and bell crank (33) at transmission with screw (30), new lockwasher (31) and flat washer (32).

C Install rod assembly (29) with pin (28), flat washer (27), new cotter pin (26), new lockwasher (25) and screw (24).

D Install rod assembly (23) with screw (21) and new lockwasher (22).

E Install base assembly with shaft (20) with four screws (17) and four new lockwashers (18).

F Connect rod assembly (23) to shaft (20) with quick-release pin (19).

G Connect two push switch electrical leads (16).

H Install support assembly (15) with three screws (13) and three new lockwashers (14).

I Install rod assembly (12) with two pins (10 and 11), flat washer (9) and two new cotter pins (8).

J Install quadrant assembly (7) with three screws (5) and three new lockwashers (6).

K Install rod assembly (4) with two pins (3), two flat washers (2) and two new cotter pins (1).

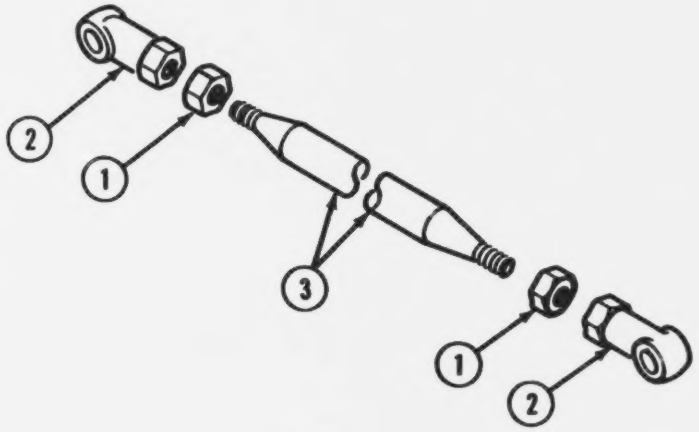
L Close and secure both transmission doors and air intake grille.

ADJUSTMENT

Refer to p 7-34 for adjustment procedures.

TA312859

ROD ASSEMBLIES: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Loosen two locknuts (1).

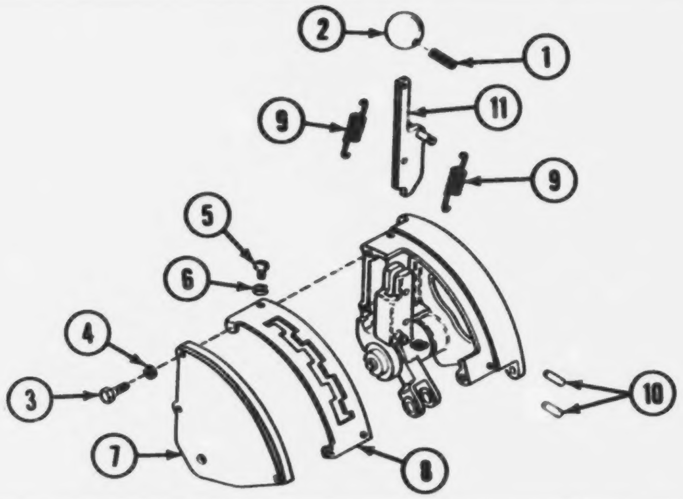
B Remove two rod ends (2) from rods.

C Remove two locknuts (1) from rod (3).

ASSEMBLY

Reverse disassembly procedures.

QUADRANT ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

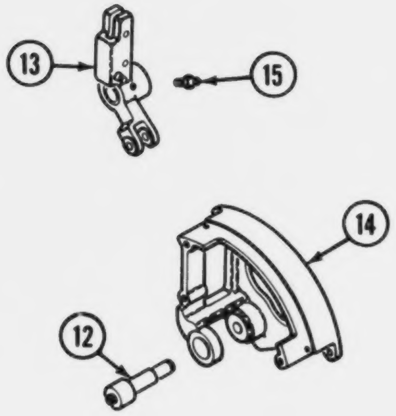
A Remove pin (1) and knob (2).

B Remove three screws (3) and three lockwashers (4), two machine screws (5) and two lockwashers (6) to release cover (7) and shift guide (8). Remove cover (7) and shift guide (8).

C Remove two springs (9) and two pins (10) to release lever (11). Remove lever (11).

TA310121

QUADRANT ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



DISASSEMBLY

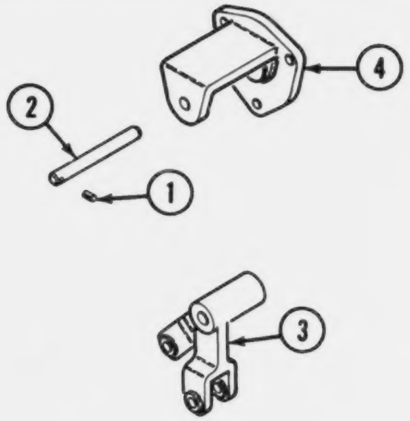
D Remove shaft (12) and lever (13) from bracket (14).

E Remove grease fittings (15) from lever (13).

ASSEMBLY

Reverse disassembly procedure.

SUPPORT ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

Remove pin (1), shaft (2) and bell crank (3) from support (4).

ASSEMBLY

Reverse disassembly procedure.

TA57223

BASE ASSEMBLY: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Wrench, open-end, 1-1/4 inch (item 70, Appx B)

Materials/Parts:

Lubricant, solid wax base (item 72, Appx D)

Equipment Condition:

Base assembly with shaft removed (page 7-29).

DISASSEMBLY

A Remove two spring pins (1). Remove two shafts (2), shaft (3) and link (4) from base assembly. Discard spring pins.

B Remove adapter (5) using 1-1/4 inch open-end wrench (item 70, Appx B). Remove switch (6) and plunger (7) from adapter (5).

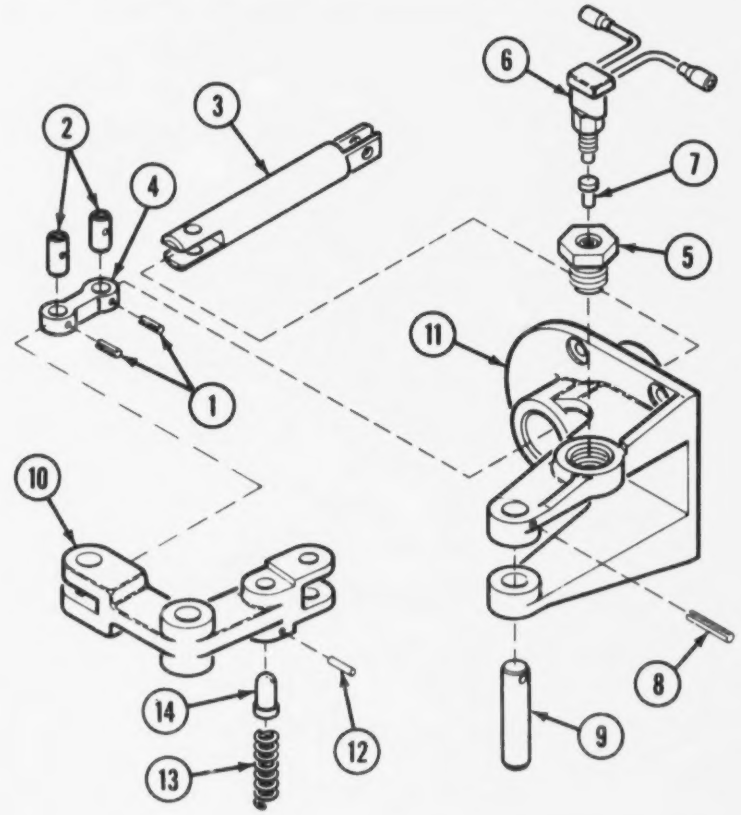
C Remove spring pin (8). Remove shaft (9) and lever (10) from base (11). Discard spring pin.

D Remove spring pin (12). Remove spring (13) and pin (14) from lever (10). Discard spring pin.

ASSEMBLY

A Install pin (14), spring (13) and new spring pin (12) in lever (10).

B Install lever (10) in base (11) with shaft (9) and new spring pin (8).



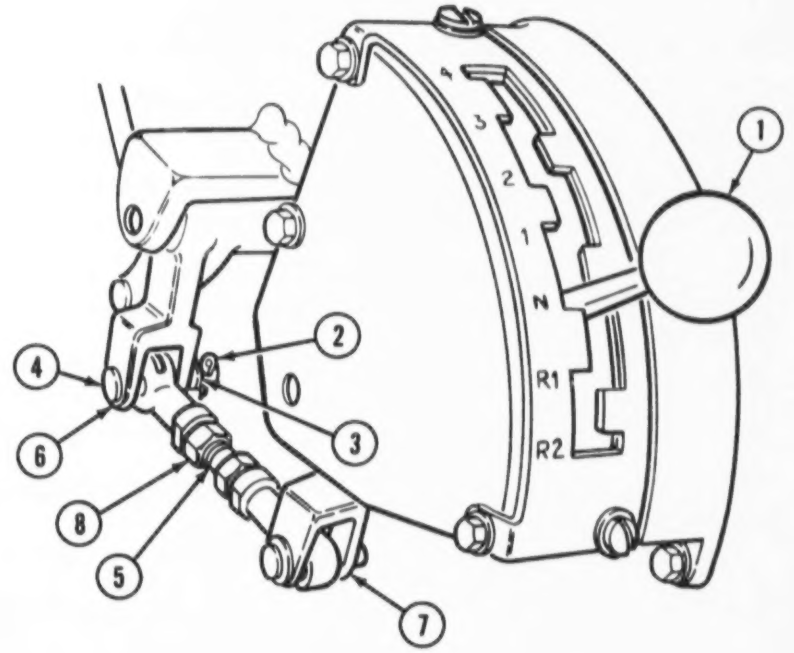
C Install plunger (7) and switch (6) in adapter (5). Install adapter (5).

D Apply lubricant (item 73, Appx D) to shaft (3).

E Install shaft (3) and link (4) on base assembly with two shafts (2) and two new spring pins (1).

TA57261

SHIFT CONTROL LINKAGE: ADJUSTMENT



ADJUSTMENT

A Open and secure air intake grille and driver's hatch.

B Place shift selector (1) in neutral (N) position.

C Remove cotter pin (2), flat washer (3) and clevis pin (4). Discard cotter pin.

D Remove shift control inner rod (5) from bell crank arm (6).

E Position bell crank arm (6) parallel to shift control arm (7) and in vertical position.

NOTE

Keep bell crank arm (6) parallel to arm (7).

F Loosen two nuts (8).

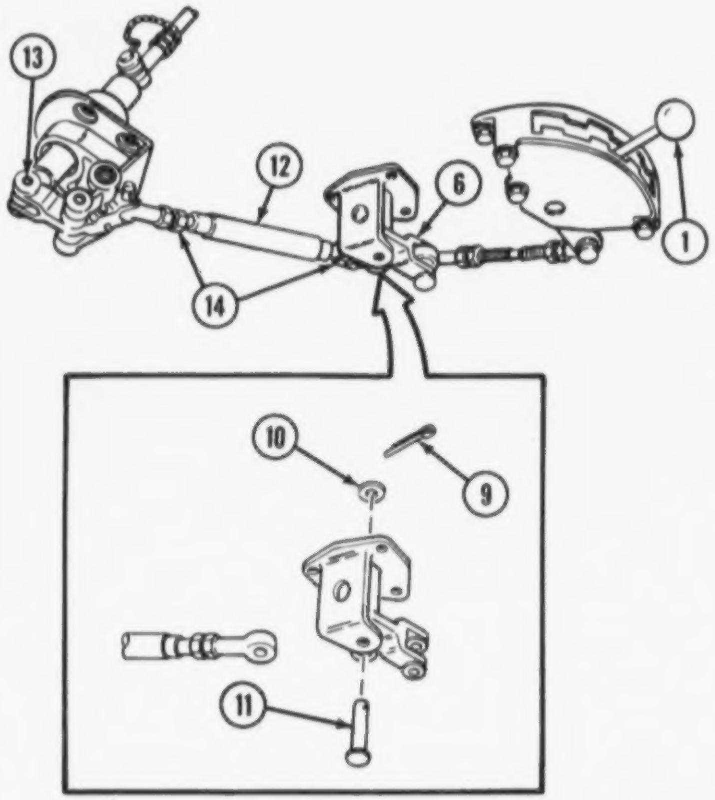
G Adjust shift control inner rod (5). Unscrew until clevis pin (4) can be installed easily.

H Install new cotter pin (2), flat washer (3) and clevis pin (4) through bell crank arm (6) and rod (5).

I Tighten two nuts (8).

TA57224

SHIFT CONTROL LINKAGE: ADJUSTMENT (CONTINUED)



J Remove cotter pin (9), flat washer (10) and clevis pin (11). Discard cotter pin.

K Remove shift control inner tube (12) from bell crank arm (6).

L Check base assembly (13) to ensure that the neutral safety switch is in neutral position. Verify by trying to crank engine after fuel shutoff has been pulled (p 5-11).

M Loosen two nuts (14).

NOTE

Keep shift selector (1) in neutral position.

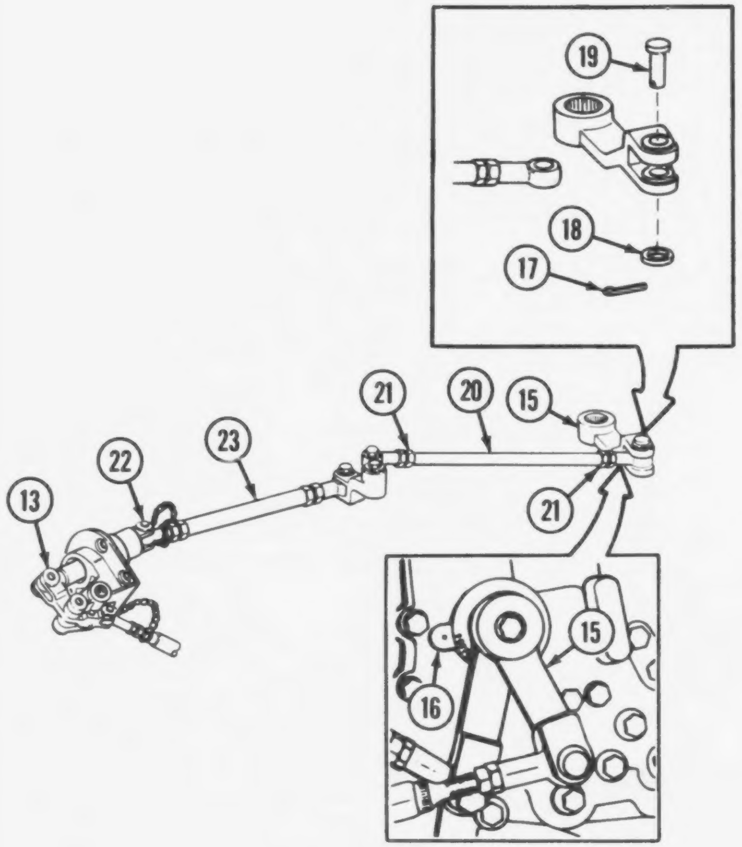
N Adjust shift control inner tube (12). Unscrew until clevis pin (11) can be installed easily into bell crank arm (6).

O Install new cotter pin (9), flat washer (10) and clevis pin (11).

P Tighten two nuts (14).

TA57225

SHIFT CONTROL LINKAGE: ADJUSTMENT (CONTINUED)



Q Check that shift control lever (15) is in neutral position at shift control lever index (16).

R Remove cotter pin (17), flat washer (18) and clevis pin (19). Discard cotter pin.

S Remove shift control outer rod (20) from shift control lever (15).

T Loosen two nuts (21).

U Adjust shift control outer rod (20). Screw/unscrew to approximately 8-1/4 inches, from center line bearing bore to center line bearing bore.

NOTE

Check that shift control lever (15) is in neutral position at index (16).

V Disconnect quick-disconnect pin (22).

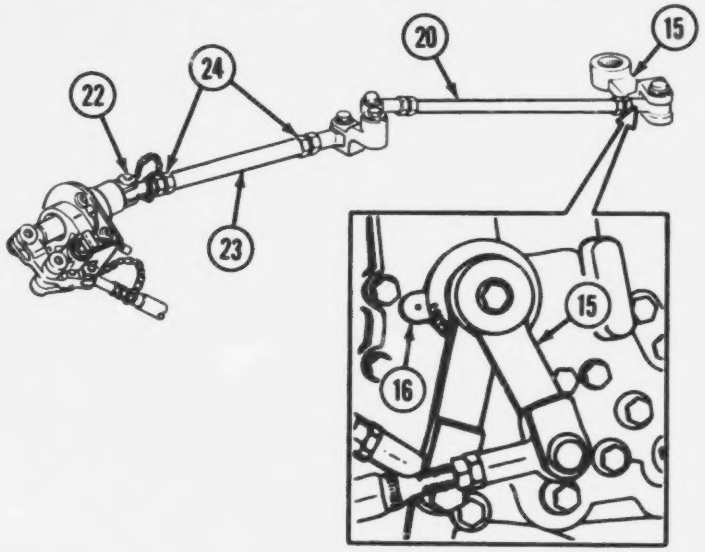
W Remove shift control outer tube (23) from base assembly (13).

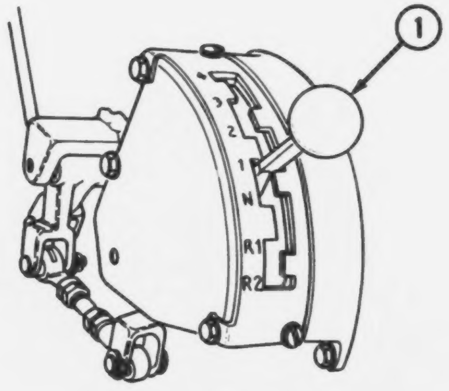
X Install shift control outer rod (20), clevis pin (19), flat washer (18) and new cotter pin (17).

NOTE

Check that shift control lever (15) is in neutral position at index (16).

TA57226





Y Loosen two nuts (24).

Z Adjust shift control outer tube (23). Unscrew until quick-disconnect pin (22) fits in easily.

AA Install quick-disconnect pin (22).

AB Tighten two nuts (24).

WARNING

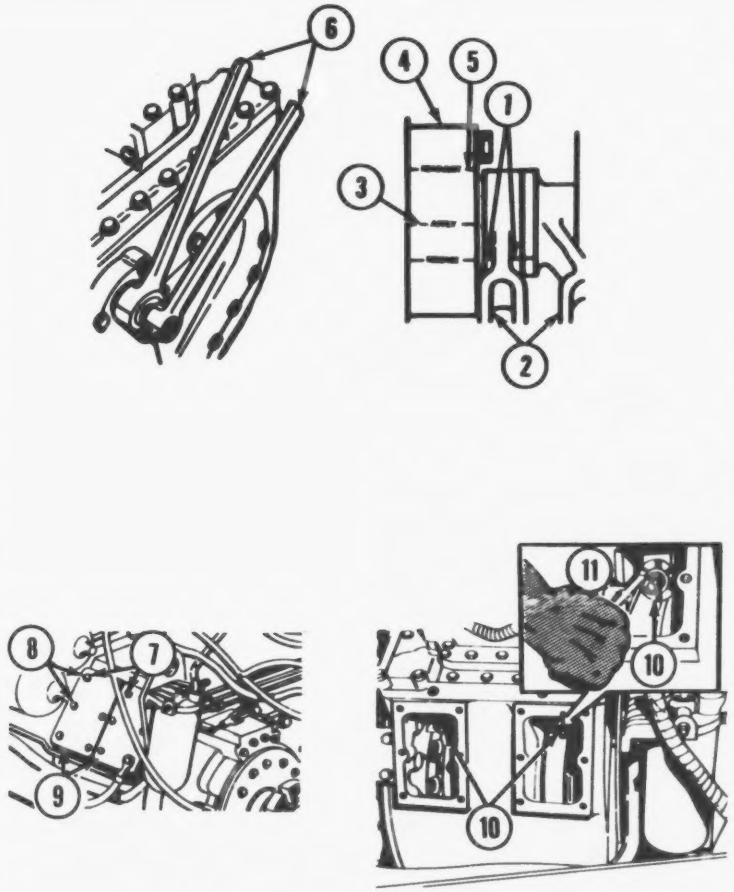
Verification of shift positions must be performed prior to starting engine. Failure to do so may result in personnel injury or damage to the vehicle.

AC Move shift selector (1) through all positions. Verify shift selector (1) setting is same as shift control lever index (16) reading at all positions.

AD Close and secure air intake grille and driver's hatch.

TA57227

TRANSMISSION INTERNAL BRAKE: ADJUSTMENT



ADJUSTMENT

NOTE

If brake linkage is not installed, brakes may be adjusted using same procedure as outlined, except that special wrenches for brake adjustment may be used to apply brakes. Brakes should be applied to approximately 90 lb-ft.

Check brake linkage adjustment.

Apply brakes fully and watch index marks (1) on brake levers (2). If index marks (1) rotate to APPLY mark (3) on retainer (4), but not to READJUST mark (5), brakes are not properly adjusted. If index marks (1) do not rotate to APPLY mark (3) or rotate past readjust mark (5), brakes must be readjusted.

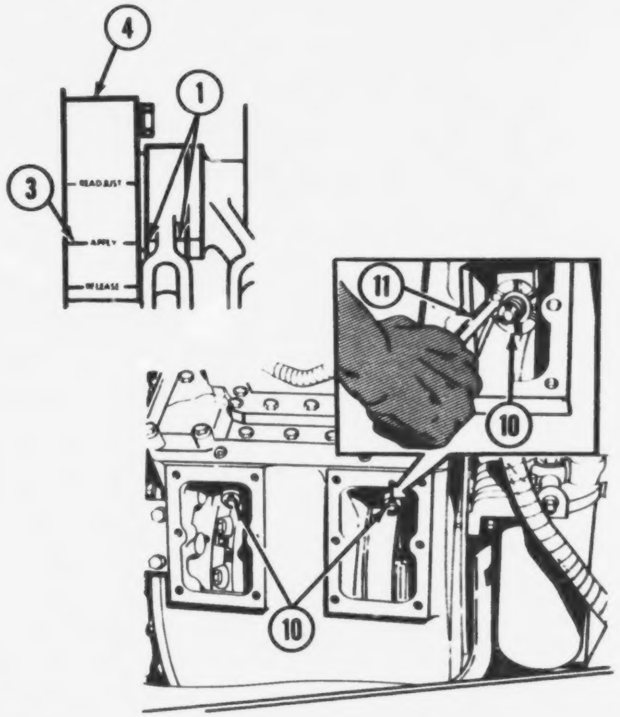
A Remove 12 screws (7), 12 washers (8) and two transmission covers (9).

B Adjust by rotating two nuts (10) counterclockwise to tighten and clockwise to loosen, using screwdriver (11).

C Apply two brakes uniformly using brake adjust wrenches (6).

TA310128

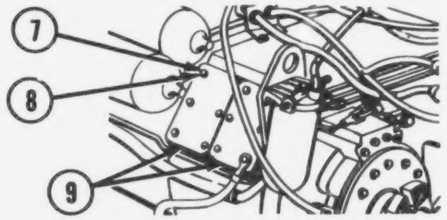
TRANSMISSION INTERNAL BRAKE: ADJUSTMENT (CONTINUED)


4
1
3
READJUST
APPLY
RELEASE
11
10
10

D Check two index marks (1) and apply mark (3) alinement on retainer (4).

NOTE

Adjust nuts (10) with screwdriver (11) until two index marks (1) are alined with apply mark (3).



E Install two transmission covers (9), 12 screws (7) and 12 washers (8).

NOTE

Perform stall test (p 7-6).

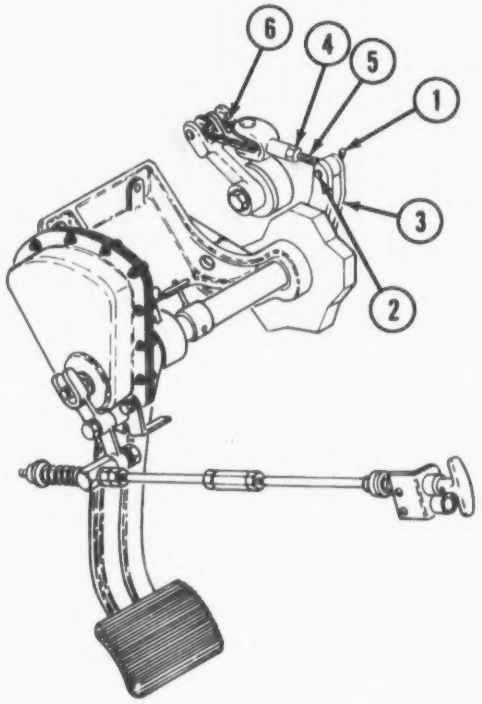
TA310129

SERVICE BRAKE LINKAGE: ADJUSTMENT

INITIAL SETUP

Equipment Condition:

Vehicle tracks blocked.



ADJUSTMENT

A Open transmission access doors.

B Remove cotter pin (1) and clevis pin (2) from shaft lever (3). Discard cotter pin.

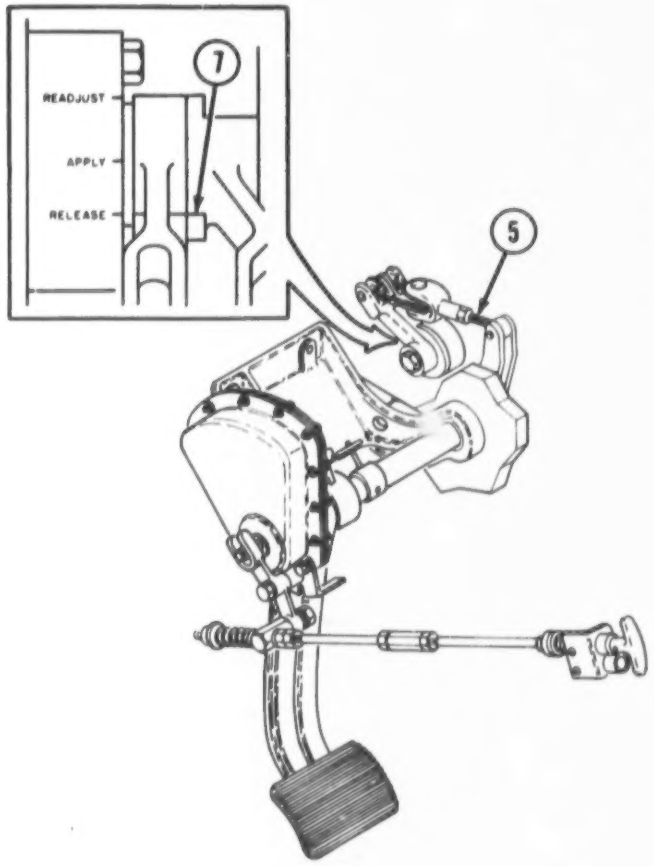
C Loosen locknut (4).

D Rotate rod end (5) until all slack is removed from brake control sprocket chain (6) when brake shaft lever index marks are at O degrees.

E Install clevis pin (2) and new cotter pin (1).

TA57228

SERVICE BRAKE LINKAGE: ADJUSTMENT (CONTINUED)



NOTE

If not alined, adjust rod (5) until marks and release point (7) are alined.

F Check apply shaft index mark for alinement with release point (7).

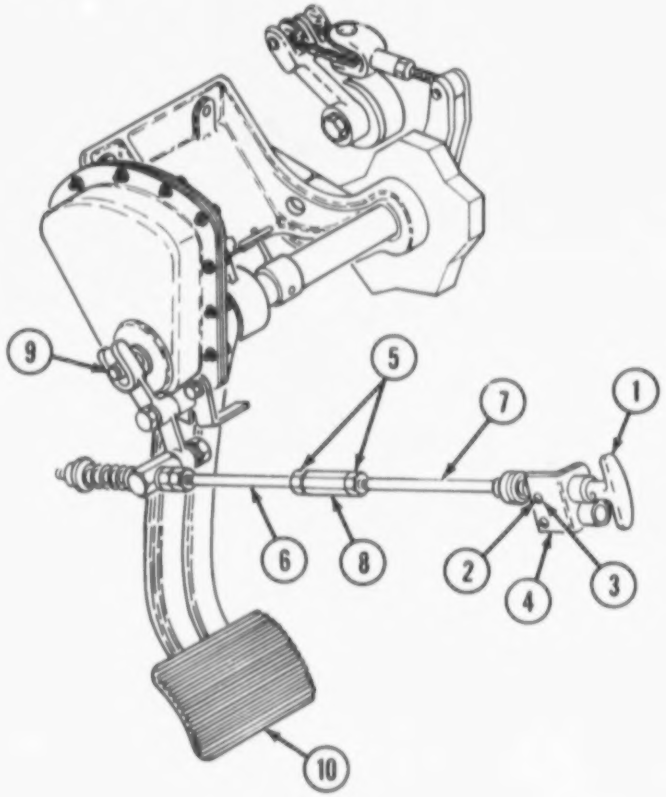
NOTE

If no further adjustment is possible, notify support maintenance.

G Close transmission access doors.

TA57231

PARKING BRAKE LINKAGE: ADJUSTMENT



ADJUSTMENT

A Unlock (up position) parking brake handle (1).

B Remove two screws (2) and two lockwashers (3) to loosen bracket (4). Discard lockwashers.

C Loosen two locknuts (5) at forward and rear brake control rods (6 and 7).

D Turn connecting nut (8) in either direction until bracket screw holes (4) line up with mating holes (not shown), and no pressure is on bell crank (9) to aline holes.

E Install two screws (2) and two new lockwashers (3) to secure bracket (4) to bulkhead.

F Tighten two locknuts (5) on forward and rear brake control rods (6 and 7).

G Depress service brake pedal (10) and pull back parking brake handle (1).

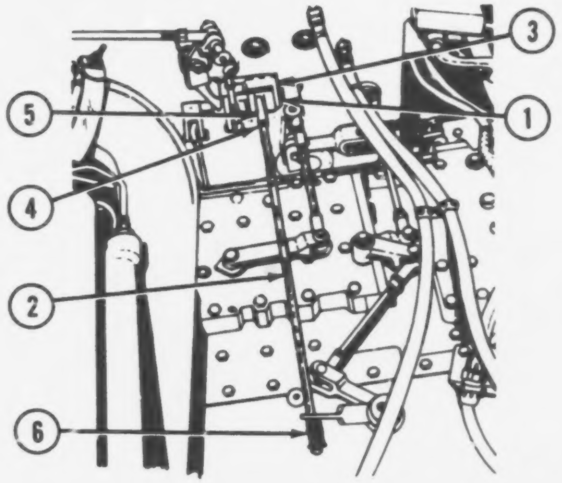
H Release service brake pedal (10).

NOTE

Parking brakes should stay locked. If not, readjust.

TA57232

TRANSMISSION THROTTLE VALVE: ADJUSTMENT



ADJUSTMENT

NOTE

Perform engine throttle governor control rod adjustment (p 7-46).

A Remove quick-release pin (1) and transmission throttle valve control rod (2) from throttle control lever bracket (3).

B Hold accelerator pedal in depressed position (p 7-47).

C Move transmission throttle valve control rod (2) against stop (towards driver's bulkhead).

D Loosen nut (4).

E Turn transmission throttle valve control rod ends (5) until pin (1) enters rod end and lever bracket freely. Turn 1/2 turn at a time.

F Release accelerator pedal (p 7-47).

G Rotate transmission throttle valve control rod end (5) two turns clockwise. Lengthen rod (2) and compress spring (6).

H Tighten nut (4).

I Install transmission throttle valve control rod (2) and quick-release pin (1) on bracket (3).

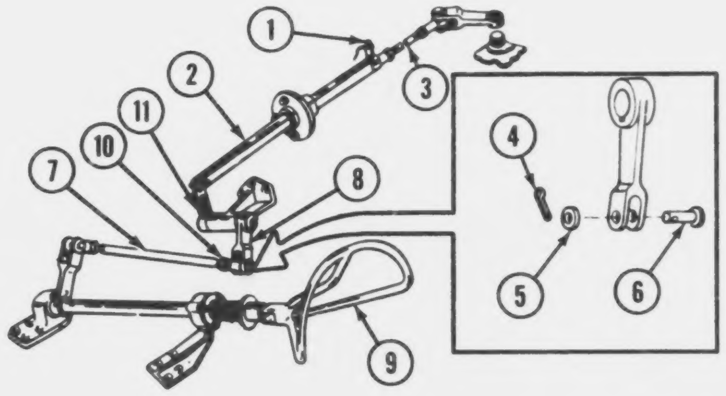
TA310133

STEERING CONTROL LINKAGE: ADJUSTMENT

INITIAL SETUP

References:

TM 9-2350-267-10



ADJUSTMENT

NOTE

Center line of steer shaft rod lever must be in line with transmission shaft pointer.

A Remove quick-release pin (1).

B Disconnect sliding steer shaft (2) from rod (3).

C Remove cotter pin (4), flat washer (5) and clevis pin (6). Discard cotter pin.

D Disconnect rod (7) from steering relay rear lever (8).

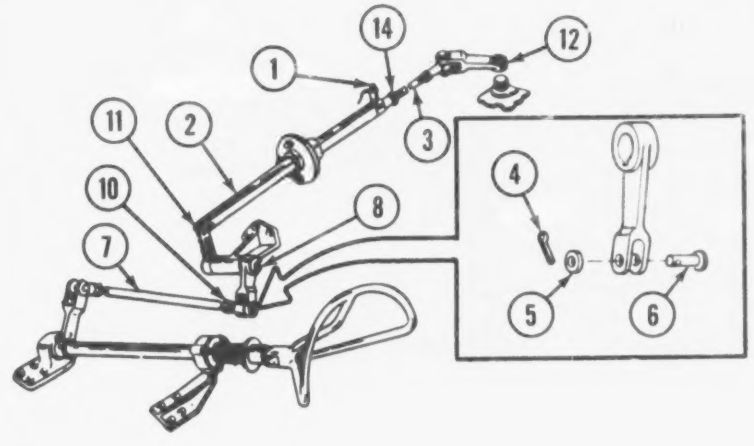
E Position steering wheel (9) in normal forward drive position. (Center spoke vertical).

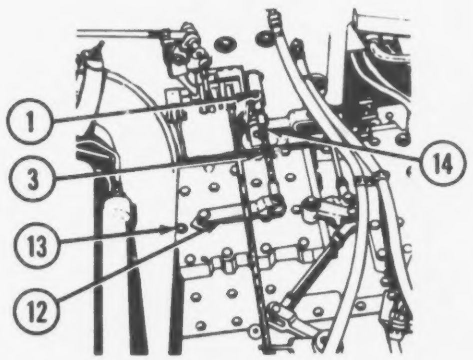
F Loosen locknut (10).

G Adjust rod (7) until steer relay front lever (11) is vertical.

TA57233

STEERING CONTROL LINKAGE: ADJUSTMENT (CONTINUED)





H Install clevis pin (6), flat washer (5) and new cotter pin (4).

I Tighten locknut (10).

J Place shaft rod adjustment lever (12) in neutral position; pointer to center mark of screw (13).

K Loosen locknut (14).

L Adjust sliding steer shaft rod (3) until quick-release pin (1) can be easily installed.

M Connect sliding steer shaft rod (3) to shaft (2) with quick-release pin (1).

N Tighten locknut (14).

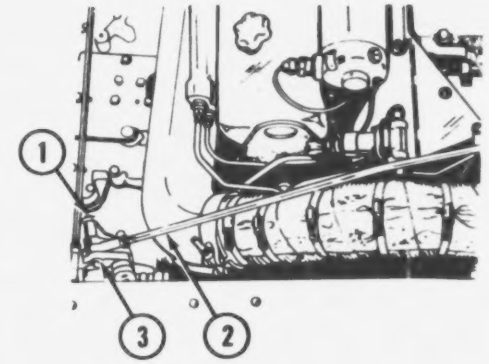
NOTE

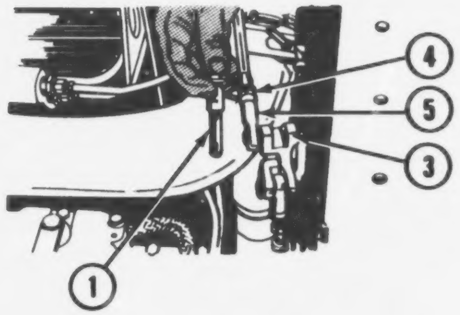
Make sure adjustment lever (12) turns in opposite direction from turn of steering wheel.

O Test drive vehicle to check steering (TM 9-2350-267-10). If steering still malfunctions, notify support maintenance.

TA57234

ENGINE THROTTLE GOVERNOR CONTROL ROD: ADJUSTMENT





ADJUSTMENT

A Open and secure driver's hatch.

B Open transmission doors.

C Fully depress accelerator pedal.

D Remove quick-release pin (1).

E Disconnect engine throttle governor control rod (2) from throttle governor control rod lever (3).

F Push throttle governor control rod (2) towards rear of vehicle.

G Loosen locknut (4).

H Turn rod end (5) until pin (1) can be easily installed.

I Tighten locknut (4).

J Install rod (2) on lever (3) with pin (1).

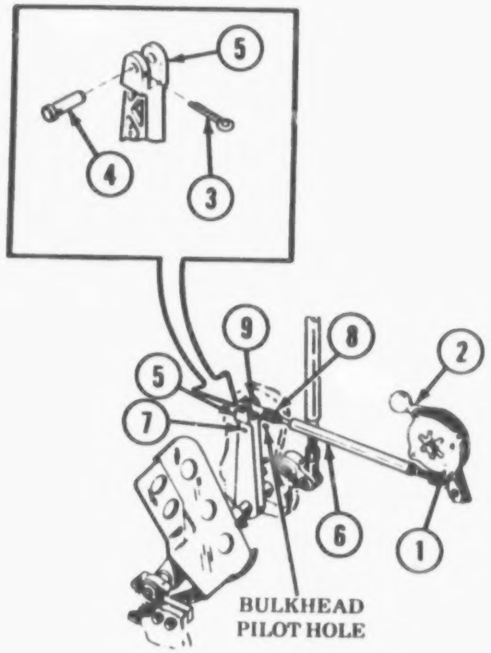
K Perform stall test (p 7-6). If malfunctioning continues, notify support maintenance.

L Close transmission doors.

M Close and secure driver's hatch.

TA57235

HAND THROTTLE CONTROL ROD AND ACCELERATOR PEDAL: ADJUSTMENT



ADJUSTMENT

A Open and secure driver's hatch.

NOTE

- 1/4-inch dowel may be used.
- Dowel fits through lever and into bulkhead pilot hole.

B Insert 1/4-inch diameter dowel pin into positioning hole (1) on throttle lever cover (2).

C Remove cotter pin (3) and clevis pin (4) from throttle lever (5). Discard cotter pin.

D Remove control rod (6) from throttle lever (5).

E Insert 1/4-inch diameter dowel pin into positioning hole (7).

F Loosen locknut (8).

G Adjust rod end (9) until clevis pin (4) can be inserted easily.

H Tighten locknut (8).

I Install rod (6), new cotter pin (3) and clevis pin (4).

J Remove dowel pins in positioning holes (1 and 7).

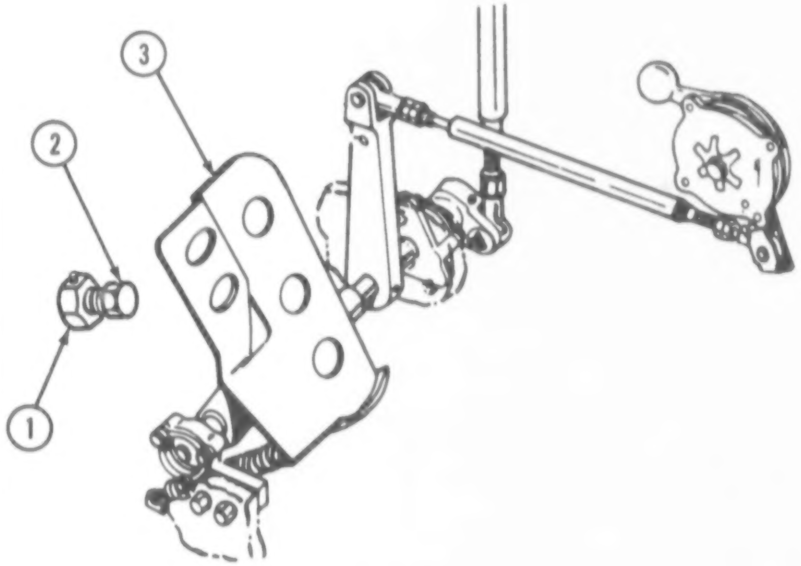
K Start engine with throttle control closed.

L Check tachometer. Engine should be at idle speed (650 rpm).

M Close driver's hatch.

TA57236

ACCELERATOR PEDAL: ADJUSTMENT



ADJUSTMENT

A Open and secure driver's hatch.

NOTE

Make certain hand throttle is properly adjusted.

B Loosen jamnut (1).

C Screw adjusting screw (2) into maximum depth.

D Depress accelerator pedal (3) until it stops, and hold in depressed position.

E Unscrew adjusting screw (2) until it touches depressed pedal (3).

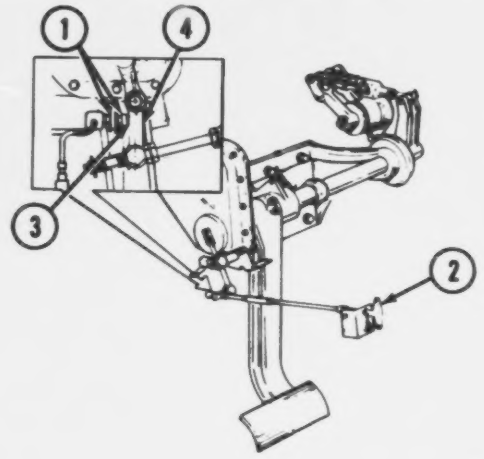
F Tighten jamnut (1).

G Perform stall test (p 7-6). If malfunctioning continues, notify support maintenance.

H Close driver's hatch.

TA57237

WARNING LIGHT SWITCH: ADJUSTMENT



ADJUSTMENT

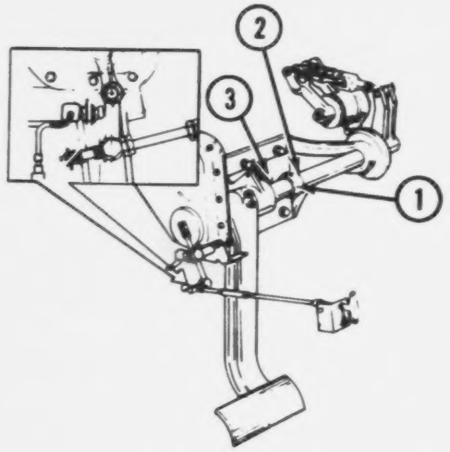
A Loosen two locknuts (1).

B Move parking brake handle (2) out 3/8 inch.

C Adjust locknut (1) on back of switch (3) until switch touches arm (4).

D Tighten front locknut (1).

STOPLIGHT SWITCH: ADJUSTMENT



ADJUSTMENT

A Depress brake pedal 3/4 inch.

B Lock brakes.

C Loosen two socket head screws (1).

D Turn stoplight actuator (2) until it touches switch (3).

E Tighten two socket head screws (1).

TA57238

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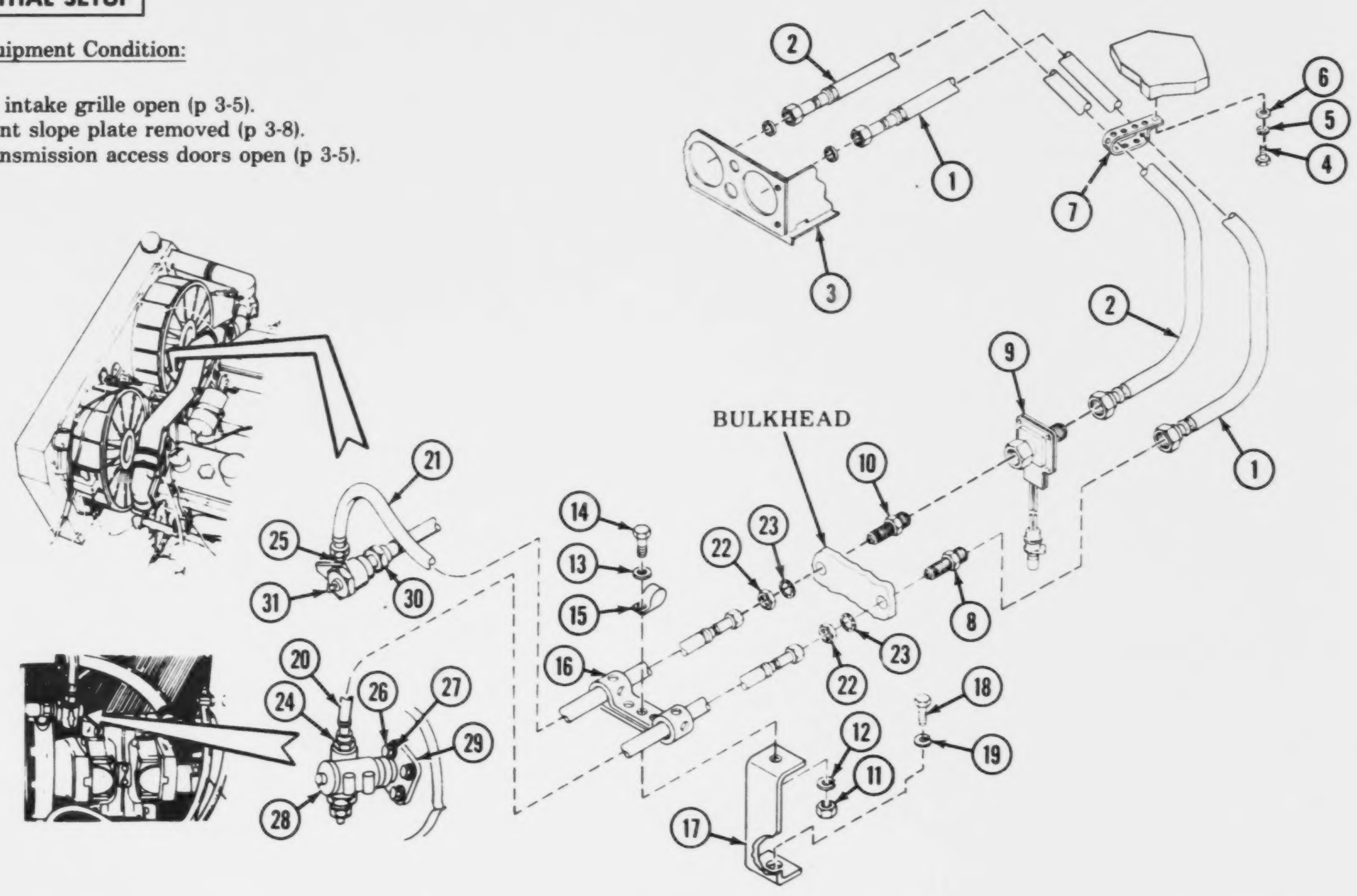
SPEEDOMETER AND TACHOMETER SYSTEMS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Air intake grille open (p 3-5).
Front slope plate removed (p 3-8).
Transmission access doors open (p 3-5).


2
1
3
6
5
4
7
2
9
1
BULKHEAD
10
21
25
31
30
14
13
15
22
23
8
16
22
23
20
24
26
27
29
28
12
11
18
19
17

TA57239

SPEEDOMETER AND TACHOMETER SYSTEMS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

WARNING

Air intake grille is held by support arm when in open position. Ensure that support arm secures air intake grille after opening. Failure to comply may result in personnel injury or death.

NOTE

Driver's portable instrument panel may have to be removed for access to cables.

A Disconnect speedometer shaft assembly (1) and tachometer shaft assembly (2) from driver's instrument panel (3).

B Remove two screws (4), two lockwashers (5), two flat washers (6) and two straps (7) (located in driver's compartment). Discard lockwashers.

C Disconnect speedometer shaft assembly (1) from adapter (8) at bulkhead and remove speedometer shaft assembly (1) from driver's compartment.

D Disconnect tachometer shaft assembly (2) from STE/ICE pulse tachometer (9) and remove tachometer shaft assembly (2) from driver's compartment.

E Remove STE/ICE pulse tachometer (9) from adapter (10).

CAUTION

Loose hardware can fall into engine compartment. Be sure that any dropped hardware is recovered before continuing with maintenance. Failure to comply may result in equipment damage.

F Remove nut (11), lockwasher (12), flat washer (13), screw (14), fuel line retaining strap (15) and retaining strap (16) at support bracket (17) on transmission. Discard lockwasher.

G Remove screw (18), lockwasher (19), and support bracket (17) from transmission compartment. Discard lockwasher.

H Disconnect speedometer flexible drive shaft (20) and tachometer flexible drive shaft (21) from adapters (8 and 10).

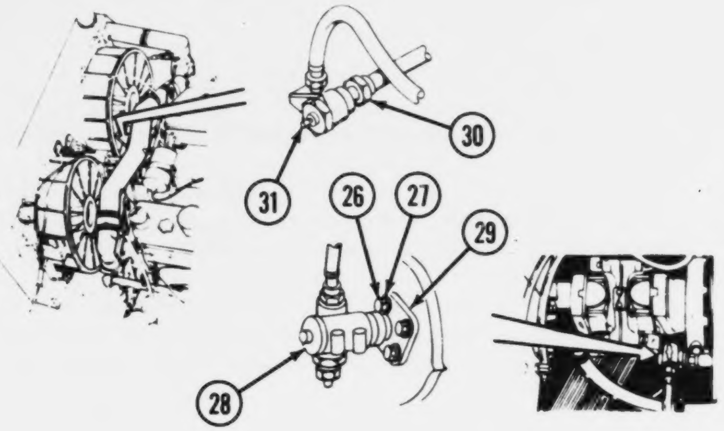
I Remove two nuts (22), two lockwashers (23) and two adapters (8 and 10) from bulkhead. Discard lockwashers.

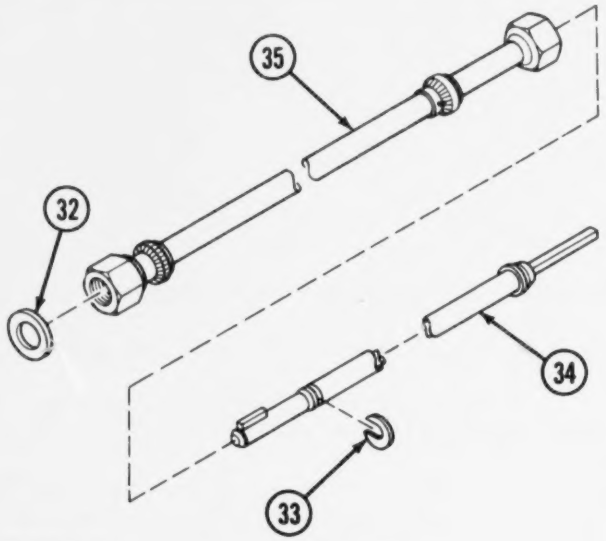
J Disconnect speedometer drive shaft (20) from drive joint (24).

K Remove tachometer drive shaft (21) from drive joint (25).

TA57240

SPEEDOMETER AND TACHOMETER SYSTEMS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)





NOTE

Speedometer adapter has a keyed pin. During removal of adapter, remove and store pin until ready for installation. Speedometer will not work without pin.

L Remove four screws (26), four lockwashers (27) and speedometer adapter (28) with preformed packing (hidden) from adapter at transmission. Discard lockwashers and preformed packing.

M Separate speedometer adapter (28) from adapter (29).

N Remove nut (30) and tachometer drive shaft adapter (31) from adapter on engine, adjacent to generator housing.

DISASSEMBLY

NOTE

Disassembly procedures apply to speedometer and tachometer shaft assemblies.

A Remove gasket (32) and slotted washer (33).

B Remove flexible drive shaft core (34) from shaft assembly (35).

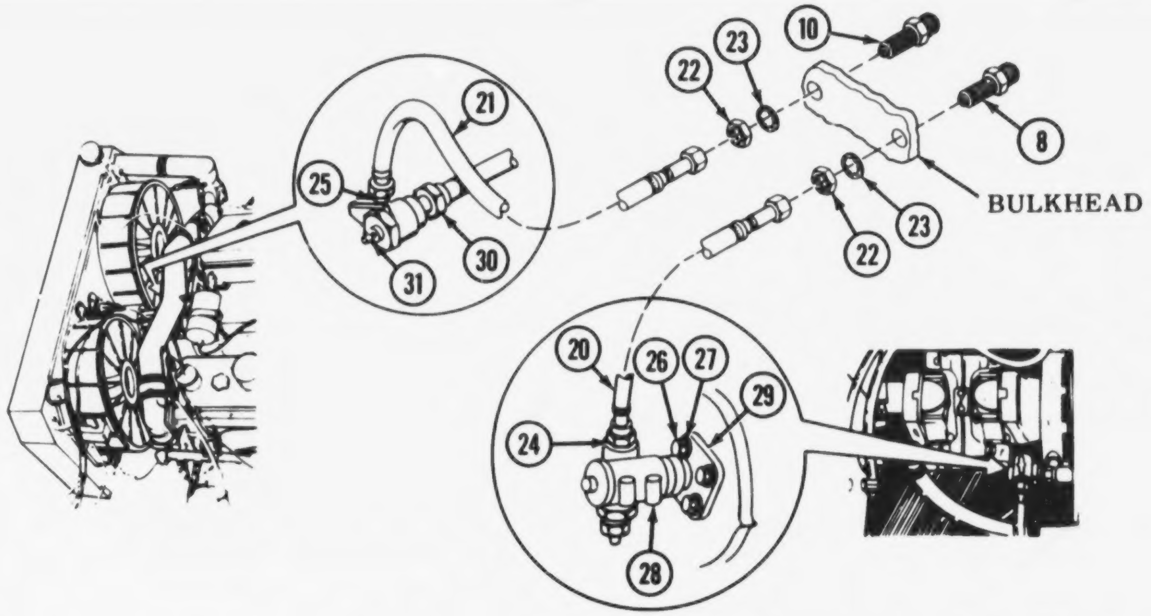
ASSEMBLY

A Install flexible drive shaft core (34) in shaft assembly (35).

B Install slotted washer (33) and gasket (32).

TA57241

SPEEDOMETER AND TACHOMETER SYSTEMS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Install tachometer drive shaft adapter (31) and nut (30) on adapter at engine, adjacent to generator housing.

NOTE

Speedometer adapter has a keyed pin. Insert pin during installation. Speedometer will not work without pin.

B Connect adapter (29) and speedometer adapter (28).

C Install speedometer adapter (28) and new preformed packing (hidden) on adapter at transmission housing with four screws (26) and four new lockwashers (27).

D Install tachometer drive shaft (21) at drive joint (25).

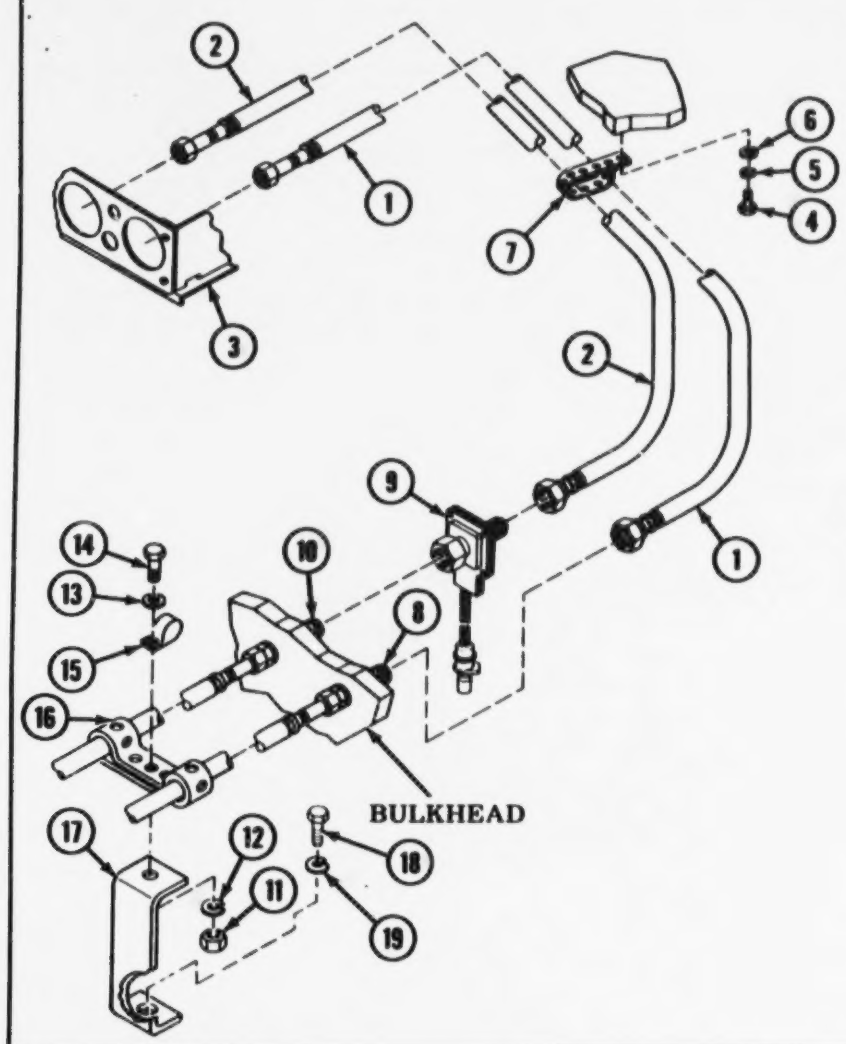
E Install speedometer drive shaft (20) at drive joint (24).

F Install two adapters (8 and 10), two new lockwashers (23) and two nuts (22) at bulkhead.

G Connect speedometer drive shaft (20) and tachometer drive shaft (21) to adapters (8 and 10).

TA57242

SPEEDOMETER AND TACHOMETER SYSTEMS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



H Install support bracket (17), new lockwasher (19), and screw (18) in transmission compartment.

I Install retaining strap (16) and fuel line retaining strap (15) on support bracket (17) at transmission with screw (14), flat washer (13), new lockwasher (12) and nut (11).

J Install STE/ICE pulse tachometer (9) on adapter (10).

K Install tachometer shaft assembly (2) on STE/ICE pulse tachometer (9).

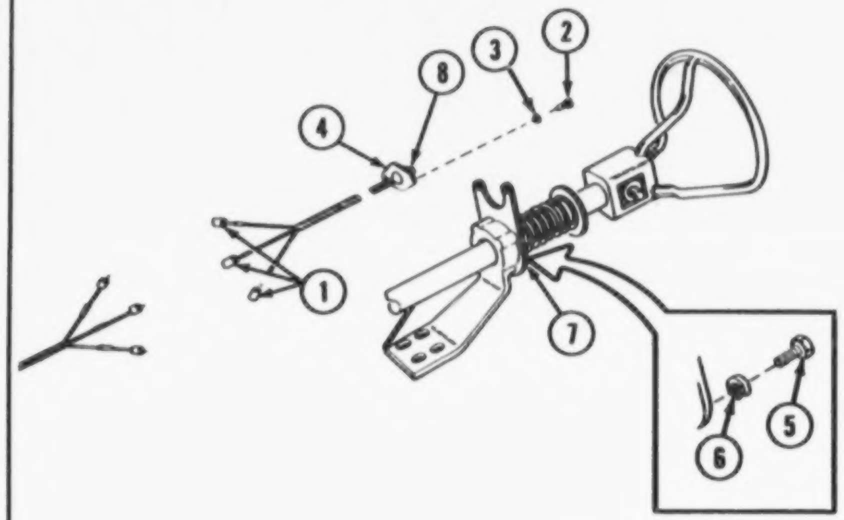
L Install speedometer shaft assembly (1) on adapter (8).

M Install two straps (7) in driver's compartment with two screws (4), two new lockwashers (5) and two flat washers (6).

N Install speedometer shaft assembly (1) and tachometer shaft assembly (2) at driver's instrument panel (3).

TA57243

MASTER WARNING LIGHT (STEERING SHAFT): REMOVAL AND INSTALLATION



REMOVAL

A Disconnect three electrical connectors (1) (p 6-84 for wire and connector identifiers).

B Remove two screws (2) and two lockwashers (3).

C Remove master warning lights (4).

D Remove three screws (5) and three lockwashers (6).

NOTE

To remove mounting bracket (7), remove steering wheel (p 7-44).

E Remove mounting bracket (7) from steering column.

INSTALLATION

Install master warning light in reverse order of removal. (See p 6-84 for wire and connector identification).

NOTE

For replacement of bulb, unscrew cap (8). Push in on bulb and turn bulb counterclockwise.

TA310143

CHAPTER 8
TRACKS, SUSPENSION SYSTEM, FINAL DRIVES AND UNIVERSAL JOINTS MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter illustrates and defines procedures for removal, disassembly, assembly, installation, checking and adjusting the M992 Track, Suspension, Final Drive and Universal Joint assemblies.

Section	I	Tracks
Section	II	Suspension System
Section	III	Final Drives and Universal Joints

Procedures and functions discussed in this chapter are in compliance with authorized organizational maintenance responsibilities as defined in the MAC.

Section I TRACKS

GENERAL

This section contains instructions on how to remove, check, adjust, and install the tracks. The tracks consist of the following:

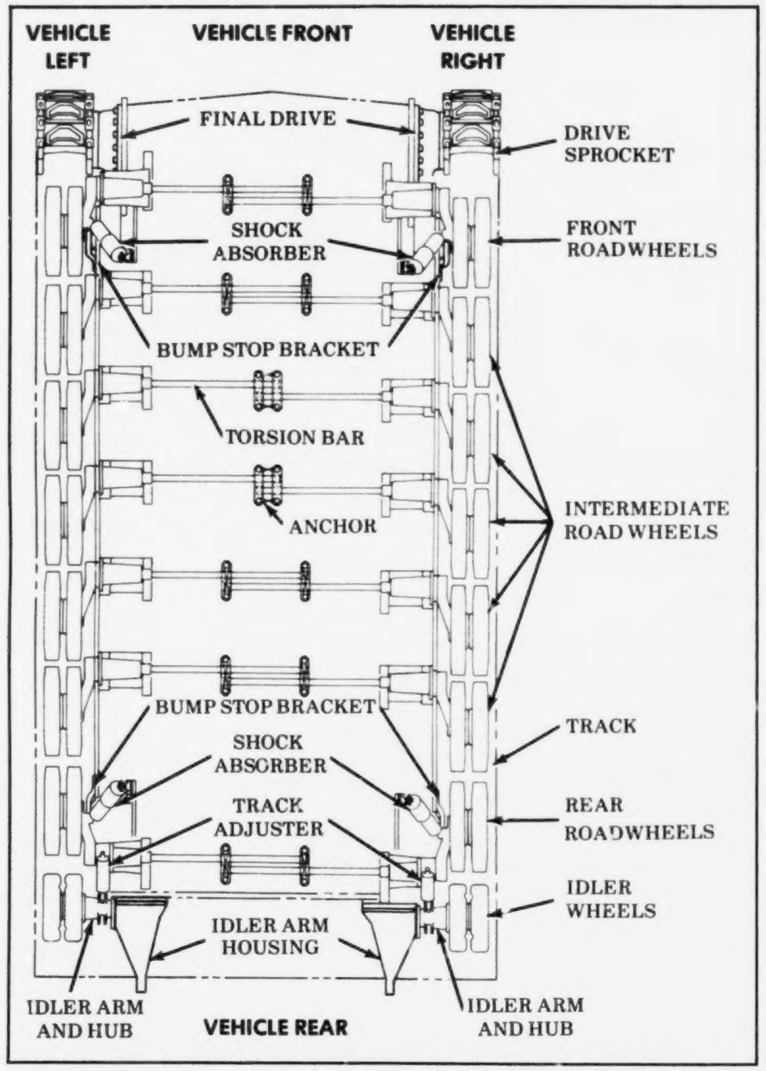
- Track pads
- Track replacement
- Track tension

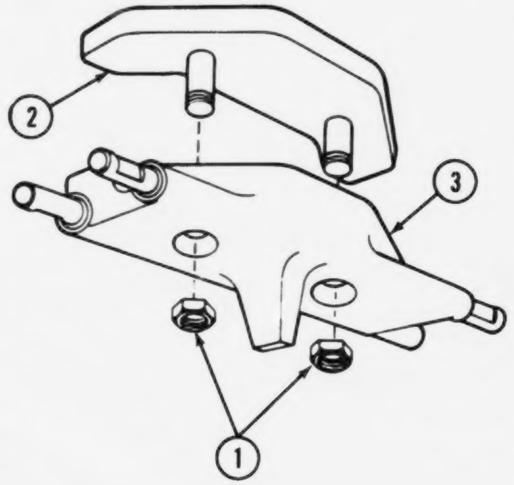
The maintenance procedures are given under the following headings:

- Track pad removal (p 8-2)
- Track shoe removal (p 8-3)
- Thrown track and track replacement (p 8-5)
- Track tension checking (p 8-8)

TA310145

TRACK PADS: REMOVAL AND INSTALLATION


VEHICLE LEFT
VEHICLE FRONT
VEHICLE RIGHT
FINAL DRIVE
DRIVE SPROCKET
SHOCK ABSORBER
FRONT ROADWHEELS
BUMP STOP BRACKET
TORSION BAR
ANCHOR
INTERMEDIATE ROAD WHEELS
BUMP STOP BRACKET
SHOCK ABSORBER
TRACK
TRACK ADJUSTER
REAR ROADWHEELS
IDLER WHEELS
IDLER ARM HOUSING
IDLER ARM AND HUB
VEHICLE REAR
IDLER ARM AND HUB



REMOVAL

A Remove two nuts (1).

B Discard track pad (2).

INSTALLATION

A Reverse removal procedure.

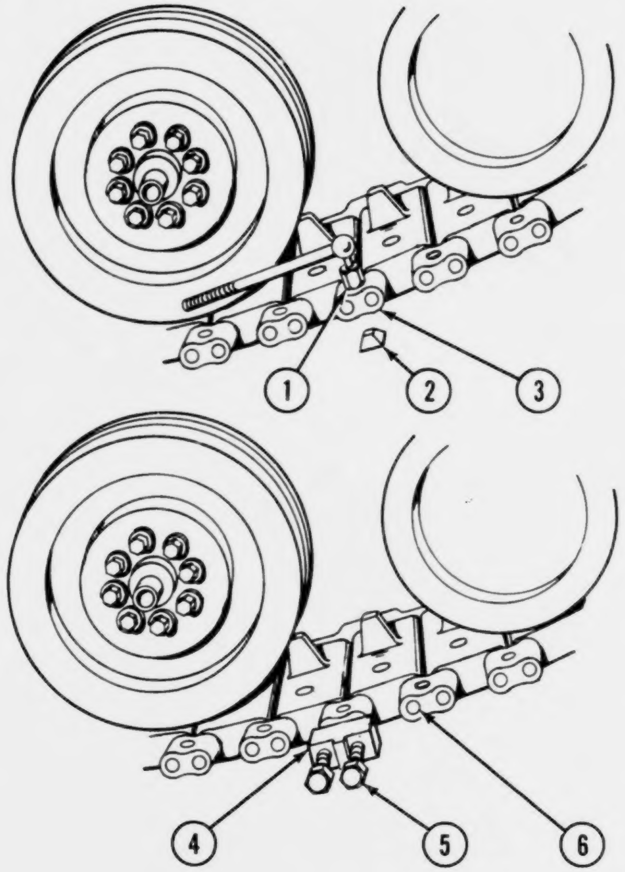
B Clean track shoe (3).

C Install new track pad (2).

D Torque nuts to 40-45 lb-ft.

TA312867

TRACK SHOES: REMOVAL AND INSTALLATION



REMOVAL

NOTE

Move vehicle so that track shoe to be removed is off the ground, either between the roadwheel and the idler wheel or between the drive sprocket and the front roadwheels.

A Decrease track tension (p 8-8).

B Remove four bolts (1) and retaining wedges (2) from four end connectors (3).

C Install end connector puller (4).

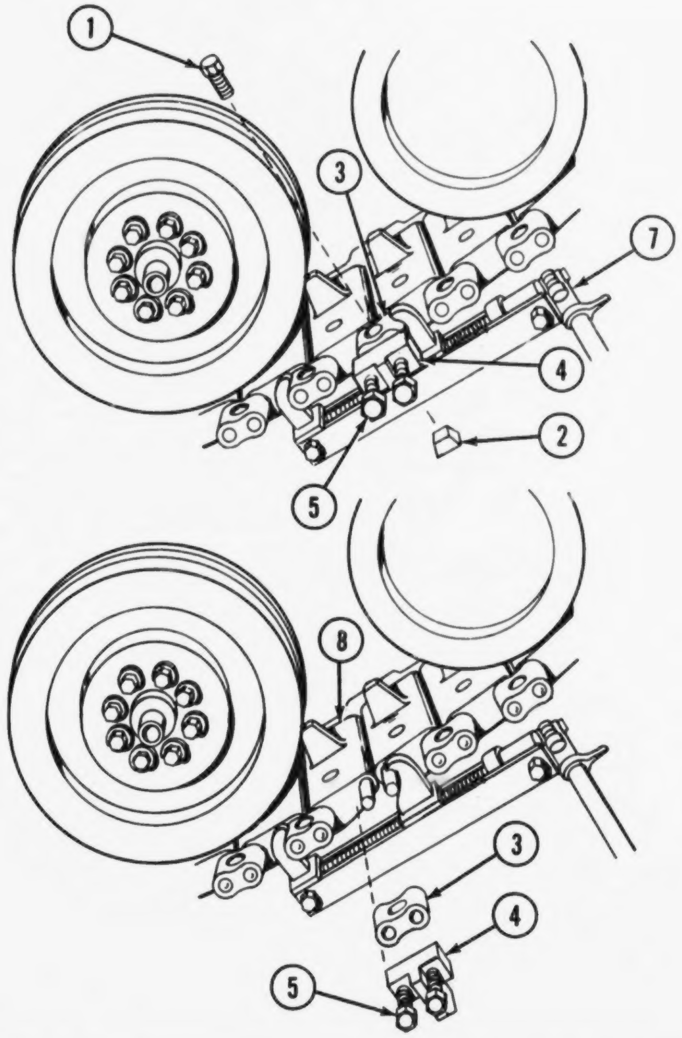
D Tighten two screws (5) against ends of track link pins (6).

NOTE

Tighten until connectors move outward approximately 1 inch.

TA310147

TRACK SHOES: REMOVAL AND INSTALLATION (CONTINUED)



E Install track connecting fixture (7) with jaws on end connectors (3) holding shoe to be replaced.

F Remove four end connectors (3), end connector puller (4) with screws (5), and track shoe (8).

WARNING

Before removing track connecting fixtures, support weight of track with crowbar to lower track to ground.

NOTE

Track removal: Use same procedures for removal of shoe, but remove only two end connectors.

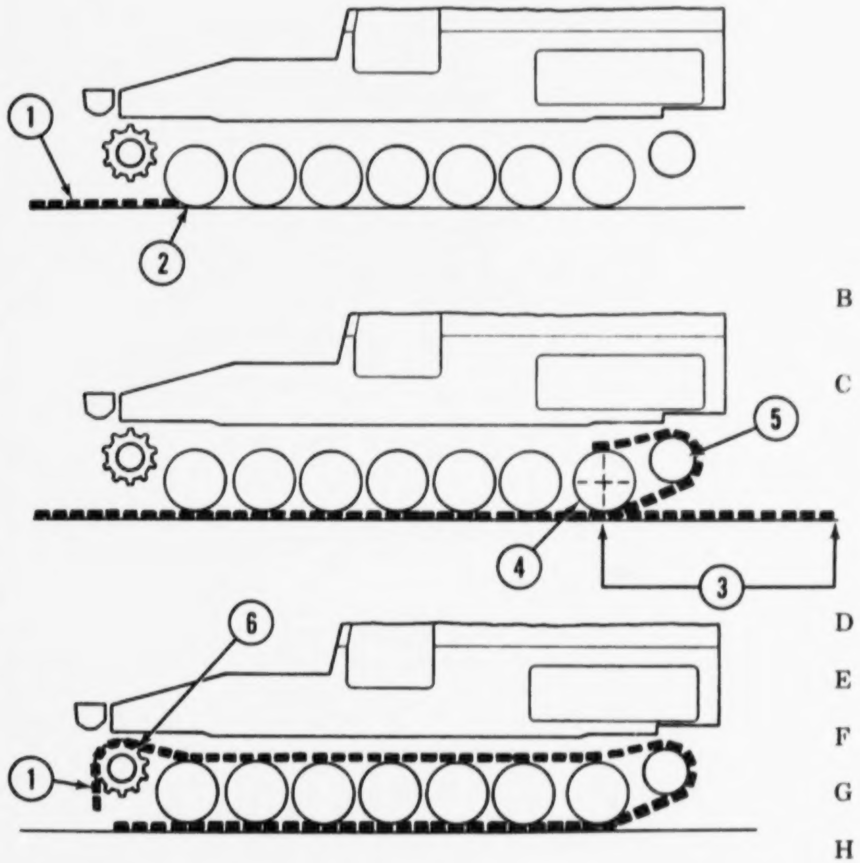
INSTALLATION

A Reverse removal procedure.

B Torque bolt (1) and retaining wedge (2) to 90 to 100 lb-ft.

TA310148

THRONN TRACK AND TRACK REPLACEMENT: INSTALLATION



INSTALLATION

A Lay track (1) out (in front of vehicle) in a straight line, touching first roadwheel (2).

CAUTION

Use extreme care when moving vehicle on only one track. Drive slowly, moving only short distances.

B Drive slowly onto track until 11 track shoes (3) extend past centerline of last roadwheel (4).

C Lift track (1) with tanker bar over idler wheel (5) to top of last roadwheel (4).

CAUTION

Raise end of track with crowbar to prevent it from getting caught between roadwheels.

D Shift lever into F-1.

E Drive M992 slowly.

F Steer in direction of removed track (1).

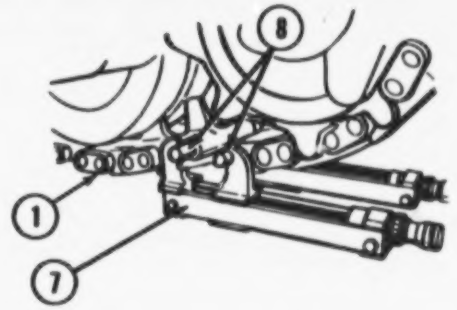
G Stop when track can be laid on drive sprocket (6).

H Steer towards opposite track (1).

I Move forward slowly.

TA310149

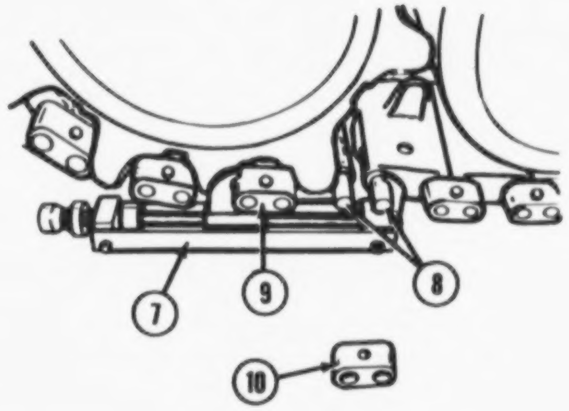
THROWN TRACK AND TRACK REPLACEMENT: INSTALLATION (CONTINUED)



J Stop vehicle when track connecting fixture (7) can be connected to track end link pins (9) on both ends of track (1).

K Apply parking brakes.

L Install two track connecting fixtures (7) over track end link pins (8).



M Tighten two track connecting fixtures (7) until track end pins (8) are close enough for fixture to be installed on nearest end connector (9).

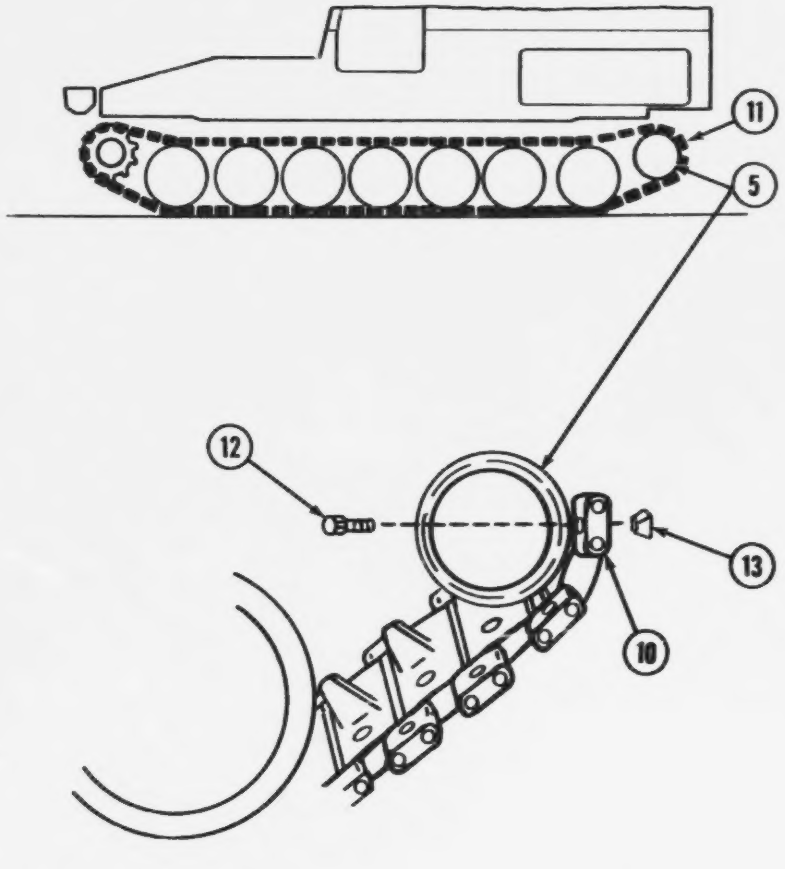
N Reinstall fixture on nearest end connector (9) and track end link pins (10).

O Tighten until end connectors (9) can be installed on track end link pins (10).

P Install two end connectors (10). Tap lightly with hammer to install.

Q Remove two track connecting fixtures (7).

TA310150



R Drive forward until two end connectors (10) are on idler wheel (5) at point (11).

CAUTION

Do not tighten the wedge bolts when the track shoes form a straight line.

NOTE

Point (11) on idler wheel (5) positions adjacent track shoes at approximately a 12-degree angle off a straight line.

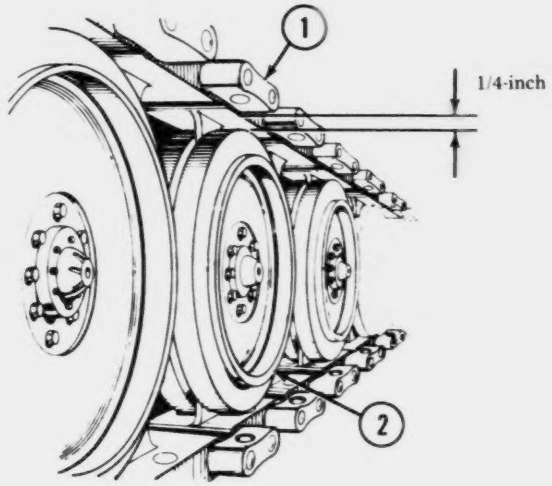
S Install two bolts (12) and two wedges (13) in end connectors (10).

T Tighten torque bolts (12) to approximately 90 to 100 lb-ft.

U Retorque bolts (12) after 50 miles of operation.

TA310151

TRACK TENSION: CHECKING AND ADJUSTING



CHECKING

A Exercise tracks:

1 Drive M992 forward and reverse several times.

2 Coast to a stop. Do NOT use brakes.

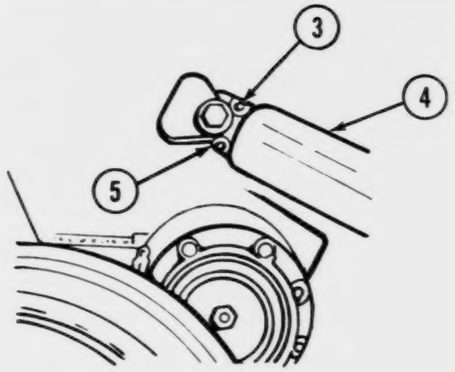
3 Place transmission in neutral.

4 Turn off engine.

B Measure distance from bottom of track (1) to top of third roadwheel (2).

NOTE

Distance should be 1/4 inch.



ADJUSTING

CAUTION

Do not allow track adjuster to extend more than 3-1/2 inches. Remove a shoe to shorten track if necessary.

A Clean input pressure fitting (3).

B Increase tension by raising track away from third roadwheel.

C Add lubricant to track adjuster (4) until measurement from top of roadwheel to bottom of track is 1/4 inch.

D Decrease tension by loosening bleed plug (5) and allow lubricant to escape until track hangs loose.

E Tighten bleed plug (5) and clean off excess lubricant.

F Repeat step C.

TA57251

Section II SUSPENSION SYSTEM

GENERAL

This section contains instructions on how to remove, disassemble, assemble, install, and adjust the suspension system. The suspension system consists of the following:

- Roadwheels
- Roadwheel hubs
- Roadwheel arm
- Torsion bars
- Torsion bar anchors
- Track adjuster and mounting bracket
- Idler wheels and hub
- Idler arm assembly
- Idler arm housing
- Shock absorber and shock absorber bearing

The maintenance procedures are given under the following headings:

- Roadwheels removal (p 8-11)
- Roadwheel hubs disassembly (p 8-13)
- Roadwheel arm removal (p 8-16)
- Torsion bars removal (p 8-17)
- Torsion bar anchors removal (p 8-19)
- Track adjuster and mounting bracket removal (p 8-20.1)
- Idler wheels and hub removal (p 8-22)
- Idler arm assembly removal (p 8-23)
- Idler arm housing removal (p 8-25)
- Shock absorber and suspension bracket removal (p 8-26)
- Shock absorber bearing removal (p 8-27)

TA312868

TORSION BAR, ANCHOR, AND ROAD WHEEL ARM HUB ASSEMBLY IDENTIFICATION CHART (LEFT)

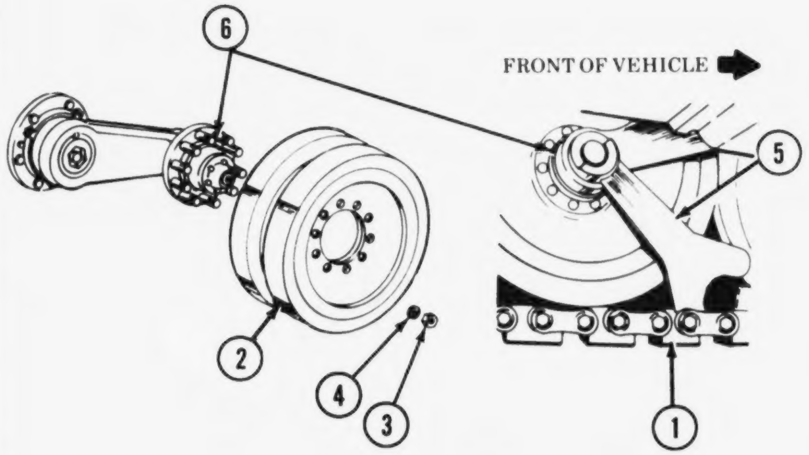
VEHICLE POSITION	TORSION BAR PART NUMBER	IDENTIFYING ARROW (PRESET)	ANCHOR PART NO.	LOCATION OF BLIND SPLINE IN ANCHOR	ROAD WHEEL ARM AND HUB ASSEMBLY PART NO.
1 FRONT	10898191-1	↶	10921192-1	12 O'CLOCK	10925061-1
2 INTERMEDIATE	10898191-1	↶	10921192-1	12 O'CLOCK	10925059
3 INTERMEDIATE	10898193	↶	10921192-1	12 O'CLOCK	10925059
4 INTERMEDIATE	10898193	↶	10921192-1	12 O'CLOCK	10925059
5 INTERMEDIATE	10898193	↶	10921192-1	12 O'CLOCK	10925059
6 INTERMEDIATE	10898193-1	↶	10921192-1	12 O'CLOCK	10925059
7 REAR	10898191-2	↷	10921192-2	12 O'CLOCK	10925061-2

TORSION BAR, ANCHOR, AND ROAD WHEEL ARM HUB ASSEMBLY IDENTIFICATION CHART (RIGHT)

VEHICLE POSITION	TORSION BAR PART NUMBER	IDENTIFYING ARROW (PRESET)	ANCHOR PART NO.	LOCATION OF BLIND SPLINE IN ANCHOR	ROAD WHEEL ARM AND HUB ASSEMBLY PART NO.
1 FRONT	10898191-2		10921192-2	12 O'CLOCK	10925061-2
2 INTERMEDIATE	10898191-2	↷	10921192-2	12 O'CLOCK	10925059
3 INTERMEDIATE	10898194	↷	10921192-2	12 O'CLOCK	10925059
4 INTERMEDIATE	10898194	↷	10921192-2	12 O'CLOCK	10925059
5 INTERMEDIATE	10898194	↷	10921192-2	12 O'CLOCK	10925059
6 INTERMEDIATE	10898194-1	↷	10921192-2	12 O'CLOCK	10925059
7 REAR	10898191-1	↶	10921192-1	12 O'CLOCK	10925059-1

TA310154

ROADWHEELS: REMOVAL AND INSTALLATION



REMOVAL

NOTE

This procedure applies to roadwheels 2 through 6 only.

A Disconnect track (1) (p 8-5).

B Using crowbar, pull track away from top of roadwheel (2).

C Loosen (Do NOT remove) 10 nuts (3) and 10 washers (4).

D Place lifter (5) on roadwheel arm hub (6) and on inner side of track (1).

CAUTION

When driving vehicle on or off lifters, clear the area. Lifters may fly out from under the vehicle and cause serious injury to personnel.

E Drive M992 forward slowly only far enough to lift roadwheel off track.

F Remove 10 nuts (3) and 10 washers (4).

G Remove roadwheel (2) tapping lightly with hammer.

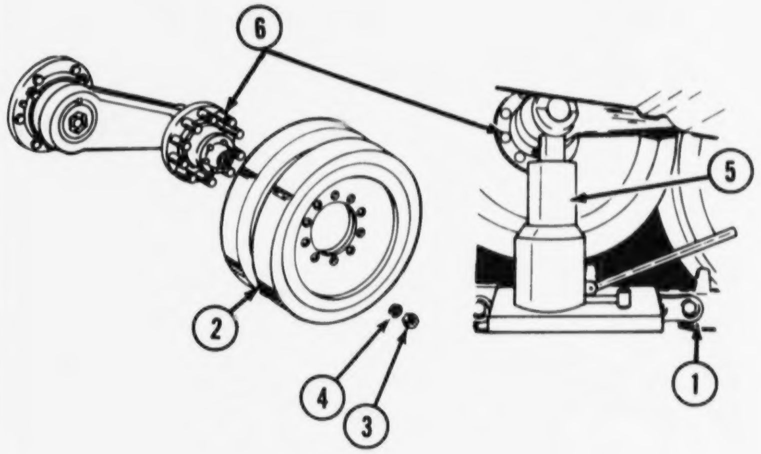
INSTALLATION

A Reverse removal instructions.

B Torque 10 nuts (3) to 170 to 180 lb-ft.

TA310155

ROADWHEELS: REMOVAL AND INSTALLATION (CONTINUED)



REMOVAL

NOTE

This procedure applies to roadwheels 1 and 7 only.

A Disconnect track (p 8-5).

B Pull track away from top of roadwheel (2).

C Loosen (do NOT remove) 10 nuts (3) and 10 washers (4).

WARNING

Use extreme caution when using hydraulic jack. Carelessness can result in damage to equipment or injury to personnel.

D Position jack (5) with base on track and head under arm hub (6).

E Jack up until roadwheel clears track.

F Remove 10 nuts (3) and 10 washers (4).

G Remove roadwheel (2).

INSTALLATION

CAUTION

When driving vehicle on or off lifters, clear the area. Lifters may fly from under the vehicle and cause serious injury to personnel.

A Reverse removal procedure.

B Torque 10 nuts (3) to 170 to 180 lb-ft.

TA310156

ROADWHEEL HUBS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

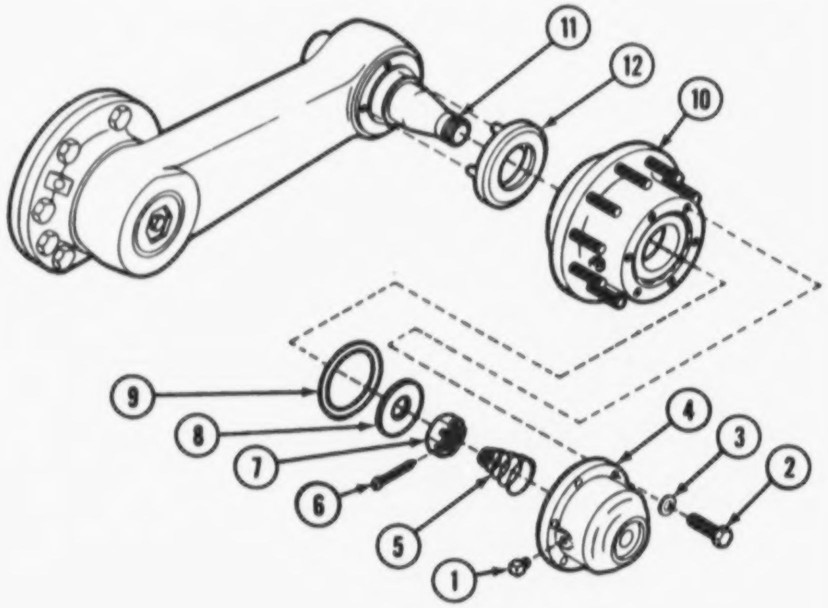
Handle, hinged, 3/4 in. dr (item 11, Appx B)
Socket, 2 in., 3/4 in. dr (item 60, Appx B)
Wrench, torque, 3/4 in. dr, 0-600 lb-ft (item 75, Appx B)
Wrench, torque, 1/2 in. dr, 0-175 lb-ft (item 74, Appx B)
Replacer, bearing, inner (item 16, Appx B)
Replacer bearing, outer (item 17, Appx B)

References:

LO 9-2350-267-12

Equipment Condition:

Vehicle blocked.
Roadwheels removed (p 8-11).



REMOVAL

A Remove plug (1) and drain oil into suitable container.

B Remove six screws (2) and six flat washers (3).

C Remove cap (4) and drain remaining oil.

D Remove static spring (5), cotter pin (6), nut (7), flat washer (8) and packing (9). Discard cotter pin and packing.

WARNING

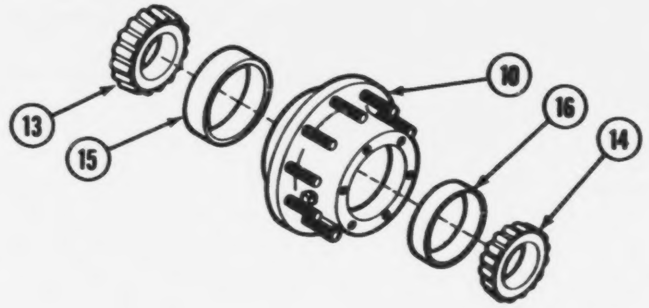
Roadwheel hub is heavy. Use two hands and remove carefully to prevent possible injury.

E Slide roadwheel hub (10) off roadwheel arm spindle (11).

F Remove seal (12).

TA312869

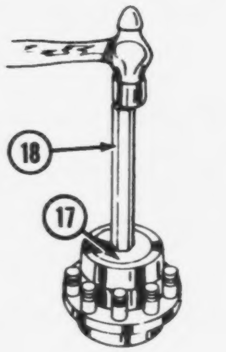
ROADWHEEL HUBS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

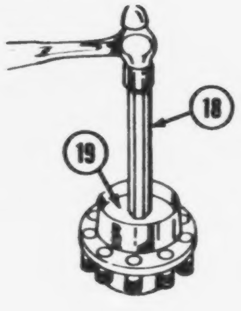


DISASSEMBLY

A Remove bearing cones (13 and 14).

B Remove bearing cups (15 and 16) if damaged.





ASSEMBLY

NOTE

Inspect and clean bearing cones before assembly.

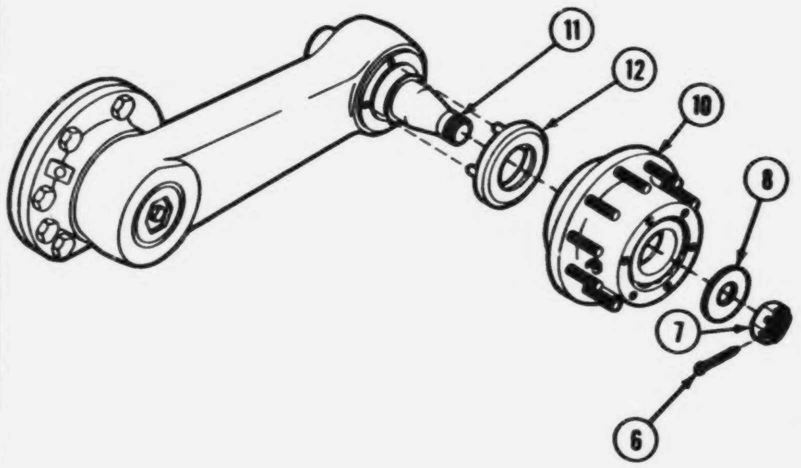
A Install new inner bearing cup (15) using inner bearing cup replacer (17) and handle (18).

B Install new outer bearing cup (16) using outer bearing cup replacer (19) and handle (18).

C Install bearing cones (13 and 14) in bearing cups (15 and 16).

TA312870

ROADWHEEL HUBS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Assemble seal (12), roadwheel hub (10), flat washer (8) and nut (7) onto roadwheel arm spindle (11).

B Torque nut (7) as follows:

1 Torque to 100 lb-ft.

2 Back off one full turn.

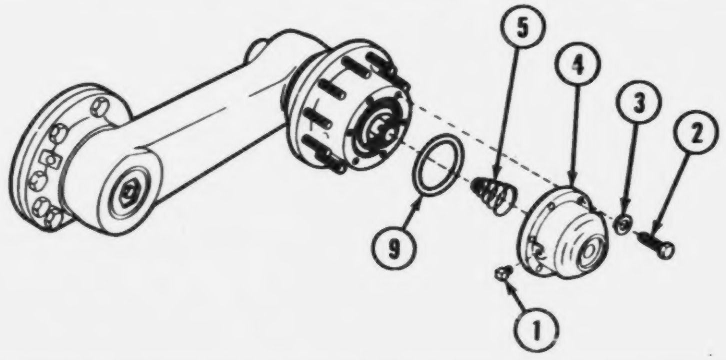
3 Torque to 30 lb-ft while rotating roadwheel hub (10).

4 Aline hole in nut (7) with hole in roadwheel arm. Backoff nut (7) until holes are alined if necessary.

NOTE

After alinement of holes and insertion of cotter pin, hub must rotate freely by hand.

C Install new cotter pin (6).



D Install new packing (9), static spring (5) and cap (4).

E Install six screws (2) and six flat washers (3).

F Torque to 12 lb-ft.

G Fill cap (4) with oil (LO 9-2350-267-12).

H Install plug (1).

TA312871

ROADWHEEL ARM: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

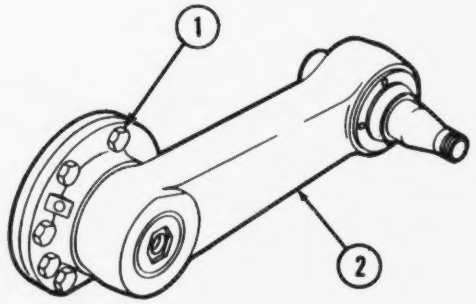
Wrench, torque, 0-600 lb-ft (item 75, Appx B)

Personnel Required:

Two

Equipment Condition:

Roadwheel hub removed (p 8-13).
Torsion bar removed (p 8-17).



REMOVAL

NOTE

Shock absorber must be disconnected to remove roadwheels 1 and 7.

A Disconnect shock absorber if necessary (p 8-26).

B Remove and discard eight screws (1).

WARNING

Roadwheel arm assembly is heavy (over 100 lb). Use two personnel to remove.

C Lift off roadwheel arm assembly (2) and remove.

INSTALLATION

A Position roadwheel arm assembly (2) on vehicle and secure with eight new screws (1). Torque screws to 170-180 lb-ft.

B Connect shock absorber if necessary (p 8-26).

TA312872

TORSION BARS: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Puller, mechanical (item 14, Appx B)
Wrench, torque, 0-175 lb-ft (item 74, Appx B)
Adapter, mechanical puller (item 6, Appx B)

Materials/Parts:

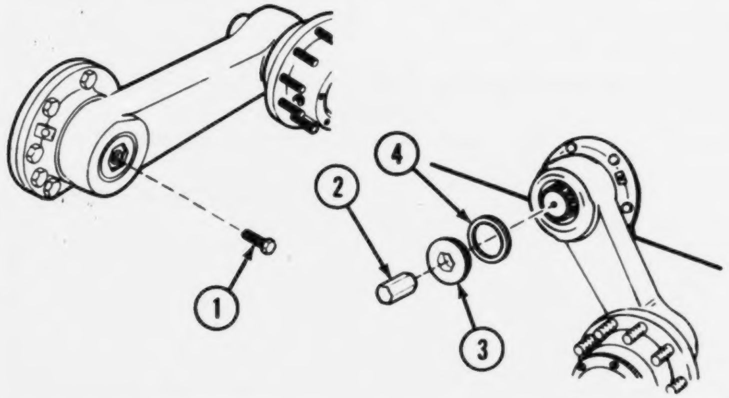
Grease, automotive (item 25, Appx B)

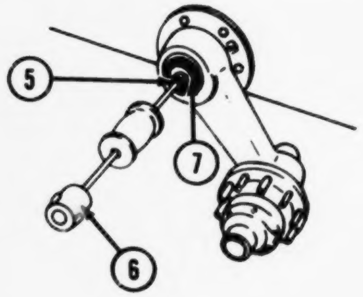
Personnel Required:

Two

Equipment Condition:

Vehicle blocked.
Roadwheel removed (p 8-11).





REMOVAL

A Remove and discard self-locking bolt (1).

B Insert plug wrench (2) in retainer (3) and turn counterclockwise.

C Remove retainer (3) and gasket (4) from end of torsion bar. Discard gasket.

D Install adapter (5) and puller (6).

NOTE

If torsion bar is broken and other end of torsion bar cannot be reached for removal, it may be necessary to remove torsion bar anchors of corresponding torsion bar (p 8-19).

E Remove torsion bar (7).

TA312873

TORSION BARS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Identify torsion bar data (p 8-10).

B Coat each torsion bar spline end with grease (item 25, Appx B).

CAUTIONS

Do not remove tape from ground (unsplined) surface of torsion bars.

Never pound torsion bar with hammer. Torsion bar should slide in by hand.

NOTES

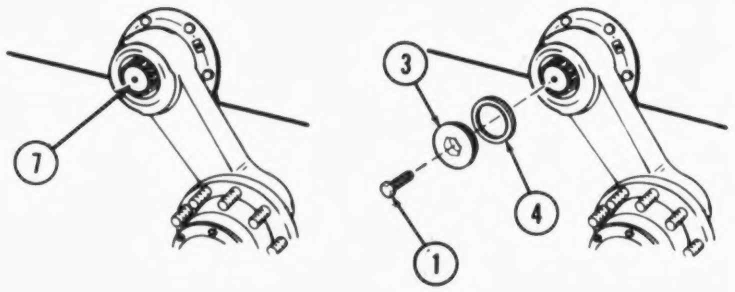
Hold roadwheel arm at 4 o'clock position on vehicle left side, and 8 o'clock on right side, while installing torsion bars.

Ensure that blind splines on both ends aline with blind splines on anchor and roadwheel arm.

C Install torsion bar (7).

D Install new gasket (4) and retainer (3).

E Install new self-locking bolt (1). Torque bolt to 90 lb-ft.



TA312874

TORSION BAR ANCHORS: REMOVAL, CLEANING AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Torque wrench, 0-600 lb-ft (item 75, Appx B)

Materials/Parts:

Dry-cleaning solvent (item 20, Appx D)
Sealer (item 51, Appx D)

Equipment Condition:

Torsion bar removed (p 8-17).

REMOVAL

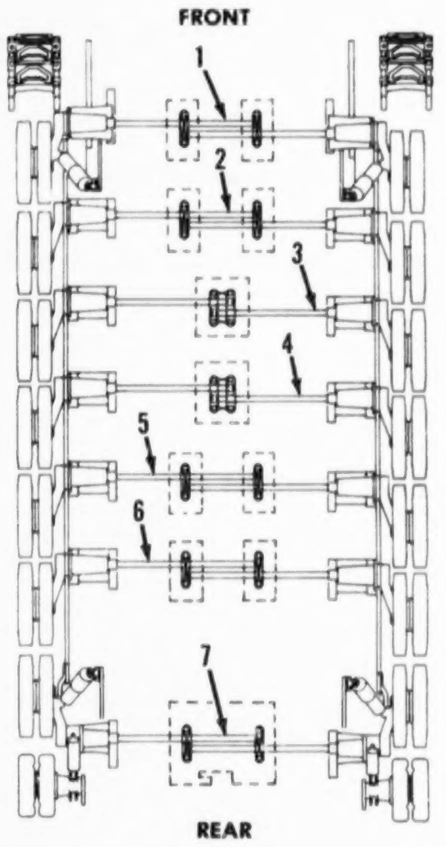
COVER PLATE REMOVAL AND INSTALLATION

	TORSION BAR NO.					
	1	2	4	5	6	7
Remove powerpack (p 3-1)	X	X				
No. of cover plate(s)	2	2	1	2	2	3
No. of screws	20	20	8	20	20	24
Remove heating and vent duct (p 14-62)			X	X		
Remove projectile rack base (p 11-3)			X	X		
Remove stacker wear strip (p 12-41)					X	

A Refer to table for access to cover plates.

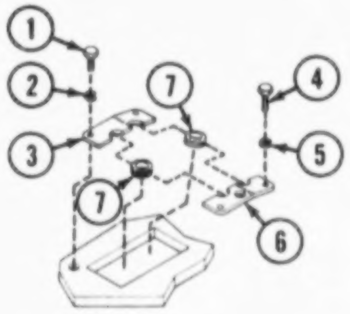
NOTE

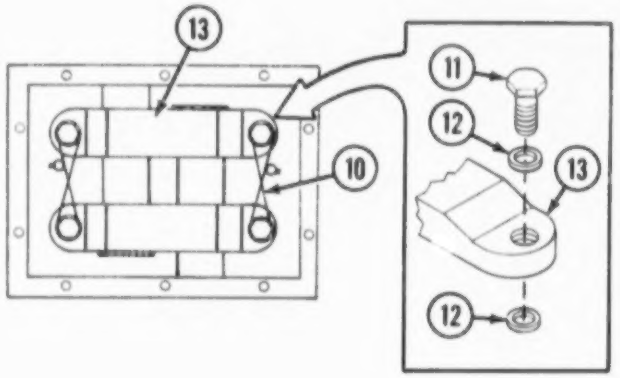
Removal of torsion bar anchors for roadwheel No. 3 is a support maintenance function.

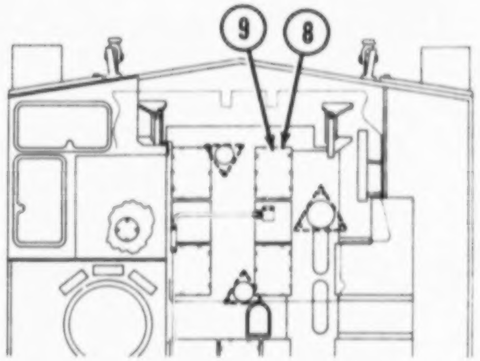


TA57712

TORSION BAR ANCHORS: REMOVAL, CLEANING AND INSTALLATION (CONTINUED)







NOTE

If removing torsion bar anchor No. 7, go to step B. If removing torsion bar anchors Nos. 1, 2, 4, 5 and 6, go to step D.

B Remove two screws (1), two lockwashers (2) and plate (3) from crew compartment floor. Discard lockwashers.

C Remove two screws (4), two lockwashers (5), plate (6) and two grommets (7) from crew compartment floor. Discard lockwashers.

D Remove screws (8) and cover plate (9).

E Remove and discard lockwire (10).

F Remove two screws (11) and four flat washers (12) from each torsion bar anchor (13).

G Remove torsion bar anchor (13).

CLEANING

A Clean torsion bar anchor cavity in hull. Remove dirt and water. Dry thoroughly.

TA58040

TORSION BAR ANCHORS: REMOVAL, CLEANING AND INSTALLATION (CONTINUED)

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

B Clean cover plate using dry-cleaning solvent (item 20, Appx D).

INSTALLATION

A Install torsion bar anchor (13).

B Install two screws (11) and four flat washers (12).

C Torque screws (11) to 245 ± 15 lb-ft and install new lockwire (10).

NOTE

- Apply sealer (item 51, Appx D) around entire edge of cover plates.
- Make sure conveyor hydraulic hoses and electrical lead are routed between two cover plates when installing.

D Install cover plate (9) with screws (8).

NOTE

If installing torsion bar anchor No. 7, go to step E. If installing torsion bar anchors Nos. 1, 2, 4, 5 and 6, go to step F.

E Position two grommets (7) and plates (3 and 6) where hose assemblies pass through crew compartment floor. Secure plate (3) with two screws (1) and two new lockwashers (2). Secure plate (6) with two screws (4) and two new lockwashers (5).

F Install items removed in table.

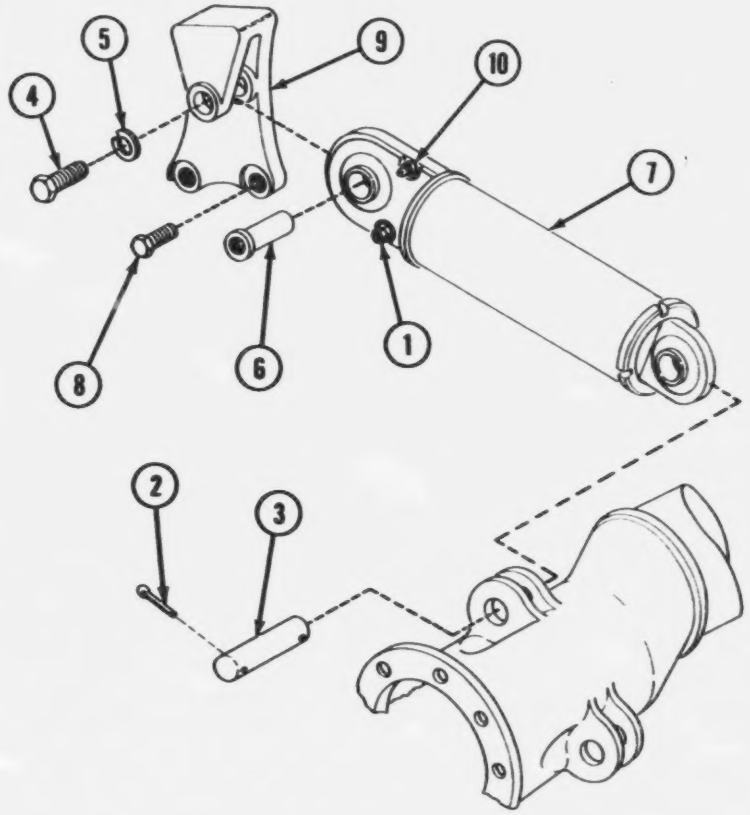
TA58030

TRACK ADJUSTER AND MOUNTING BRACKET: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Vehicle blocked.
Track removed (p 8-5).



REMOVAL

WARNING

Lubricant is under high pressure. Loosen bleed plug slowly to avoid injury.

A Loosen bleed plug (1).

B Remove two cotter pins (2) and pin (3). Discard cotter pins.

NOTE

Weld a 1-inch NC thread nut to the head of a 7/8-inch NF thread bolt, 2 inches long, and use with puller when required.

C Remove screw (4) and lockwasher (5), pivot pin (6), and adjuster (7).

D Remove two screws (8) and mounting bracket (9).

E Remove bleed plug (1) and input pressure fitting (10).

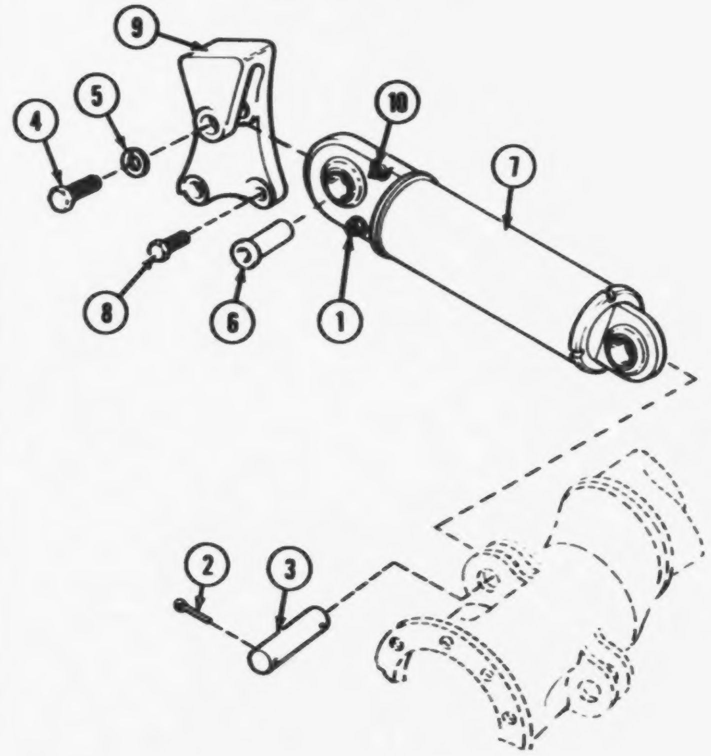
TA57252

TRACK ADJUSTER AND MOUNTING BRACKET: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Vehicle blocked.
Track removed (p 8-5).



WARNING

Lubricant is under high pressure. Loosen bleed plug slowly to avoid injury.

REMOVAL

A Loosen bleed plug (1).

B Remove two cotter pins (2) and pin (3). Discard two cotter pins (2).

NOTE

Weld a 1-inch NC thread nut to the head of a 7/8-inch NF thread bolt, 2 inches long and use with puller when required.

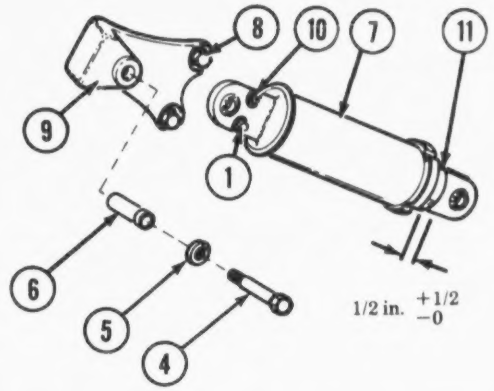
C Remove screw (4) and lockwasher (5), pivot pin (6), and adjuster (7).

D Remove two screws (8) and mounting bracket (9).

E Remove bleed plug (1) and input pressure fitting (10).

TA312877

TRACK ADJUSTER AND MOUNTING BRACKET: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install bleed plug (1) and input pressure fitting (10).

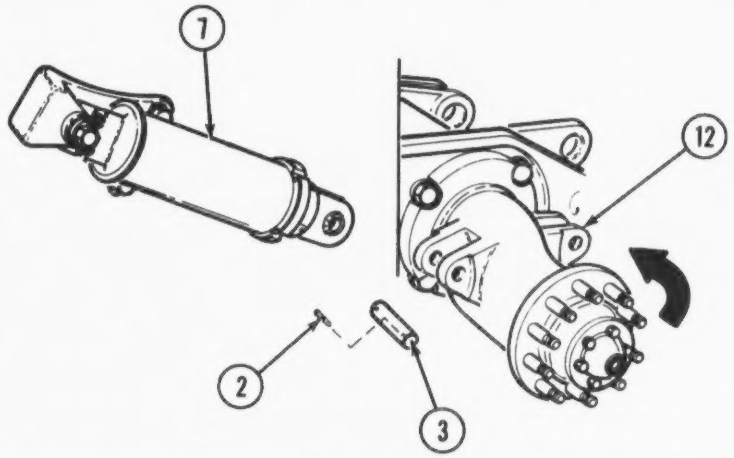
B Add lubricant to adjuster (7) through input pressure fitting (10) until piston (11) is extended 1/2 to 1 inch.

C Install mounting bracket (9) and two screws (8).

D Torque screws (8) to 300 to 350 lb-ft.

E Install adjuster (7), pivot pin (6), screw (4), and lockwasher (5).

F Torque screw (4) to 300 to 330 lb-ft.

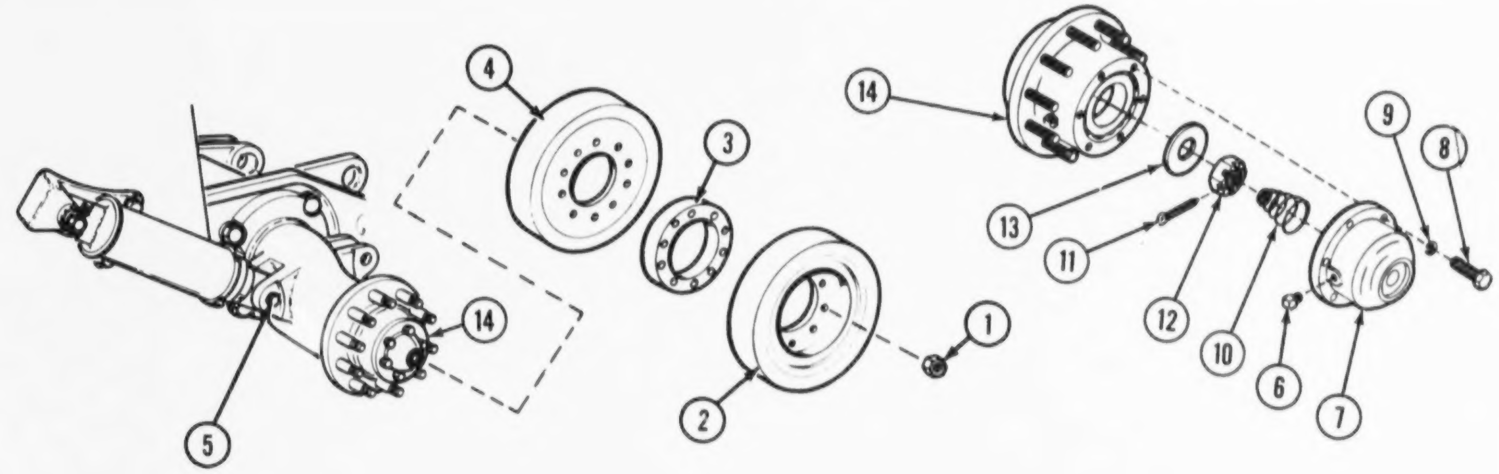


G Install pin (3) in lug hole (12). Rotate assembly counterclockwise with pry bar.

H Install adjuster (7), pin (3), and two new cotter pins (2) and adjust track (p 8-8).

TA310165

IDLER WHEELS AND HUBS: REMOVAL AND INSTALLATION



REMOVAL

A Loosen 10 nuts (1).

B Remove track (p 8-5).

C Remove 10 nuts (1).

D Remove outer idler wheel (2), spacer (3), and inner idler wheel (4).

E Remove track adjuster pin (5). Discard two cotter pins.

F Remove capscrew (6) and drain oil from cap (7).

G Remove six screws (8), six lockwashers (9), and cap (7).

H Remove static spring (10), cotter pin (11), nut (12), washer (13), and hub assembly (14). Discard cotter pin (11).

INSTALLATION

NOTE

Replenish oil in cap (7) before installation on hub.

A Reverse removal procedures.

B Replace two cotter pins on adjuster pin, and cotter pin (11) on hub assembly.

C Torque six screws (8) to 12 lb-ft.

D Torque 10 nuts (1) to 162-198 lb-ft.

TA310166

IDLER ARM ASSEMBLY: REMOVAL AND INSTALLATION

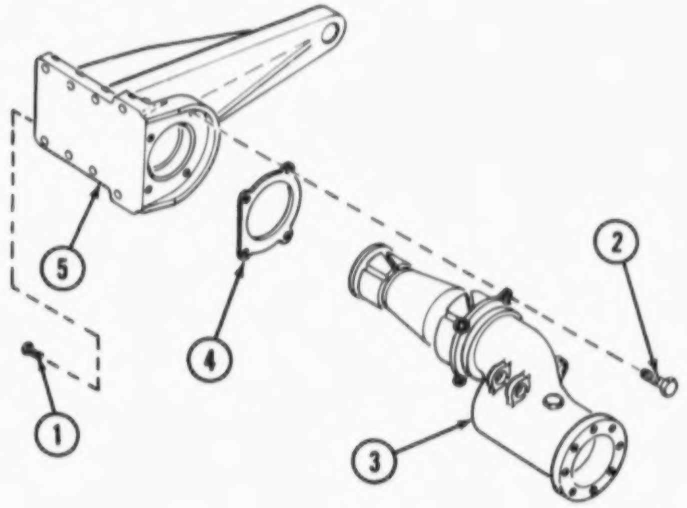
INITIAL SETUP

Test Equipment/Special Tools:

Torque wrench, 0-175 lb-ft (item 74, Appx B)
Socket, 3/4 in. dr, 1-1/8 in. (item 59, Appx B)

Equipment Condition:

Vehicle blocked.
Track removed (p 8-5).
Idler wheels and hub removed (p 8-22).
Track adjuster disconnected (p 8-20.1).



REMOVAL

A Remove plug (1).

B Remove four screws (2).

C Remove idler arm assembly (3) and gasket (4) from idler arm housing (5). Discard gasket.

TA312878

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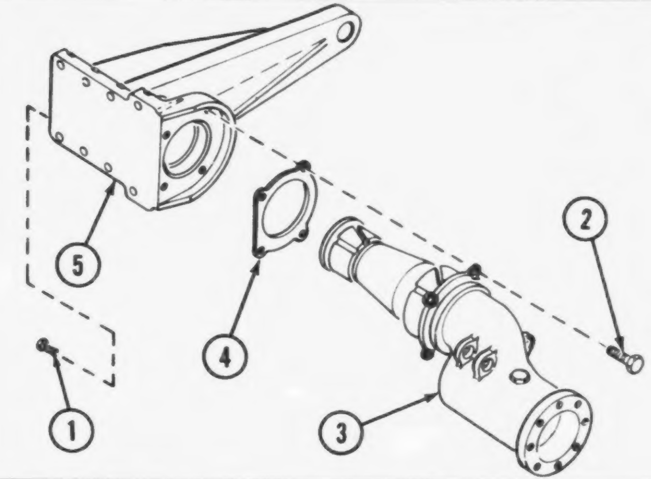
IDLER ARM ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install new gasket (4) and idler arm assembly (3) on idler arm housing (5).

B Install four screws (2) and torque to 90 lb-ft.

C Install plug (1).

IDLER ARM HOUSING: REMOVAL AND INSTALLATION

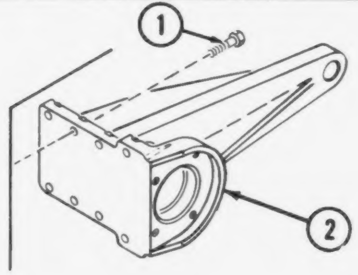
INITIAL SETUP

Test Equipment/Special Tools:

Ratchet, 3/4 in. dr (item 56, Appx B)
Socket, 1-1/8 in., 3/4 in. dr (item 59, Appx B)
Torque wrench, 0-600 lb-ft (item 75, Appx B)

Equipment Condition:

Idler arm assembly removed (p 8-23).



REMOVAL

Remove eight screws (1) and idler arm housing (2).

INSTALLATION

Install idler arm housing (2) with eight screws (1). Torque screws to 320 lb-ft.

TA312879

SHOCK ABSORBER AND SUSPENSION BRACKET: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

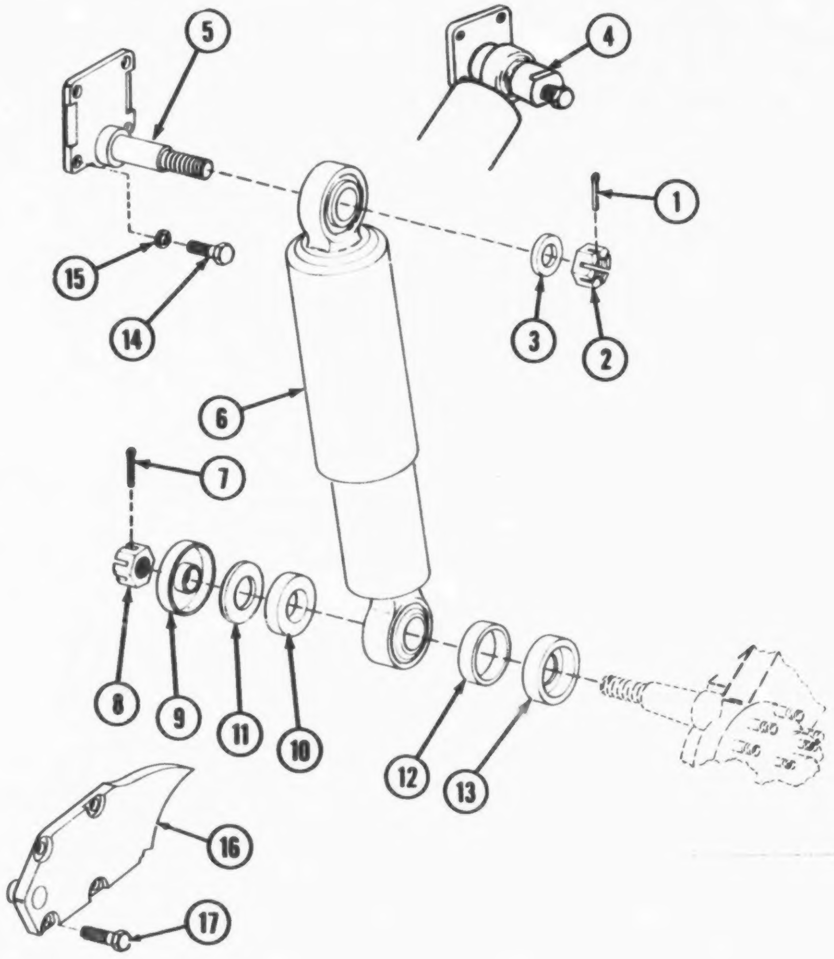
Puller, shock absorber (item 55, Appx B)
Wrench, torque, 0-600 lb-ft (item 75, Appx B)

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Equipment Condition:

Vehicle blocked.
Roadwheel removed (p 8-11).



TA312880

SHOCK ABSORBER AND SUSPENSION BRACKET: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Remove cotter pin (1), nut (2) and washer (3). Discard cotter pin.

B Install shock absorber puller (4) on threaded end of mount (5). Turn screw head with wrench to pull shock absorber (6) from arm spindle on mount (5).

C Remove top eye of shock absorber (6) from mount (5).

D Remove cotter pin (7), nut (8), retainer (9), seal (10) and washer (11). Discard cotter pin and seal.

E Remove shock absorber (6), seal (12) and retainer (13) from lower spindle/mount. Use puller (4) if necessary. Discard seal.

F Remove four screws (14), four flat washers (15) and mount (5).

G Remove suspension bracket (16) by removing four screws (17).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) to suspension bracket (16) and install with four screws (17). Torque screws to 300-350 lb-ft.

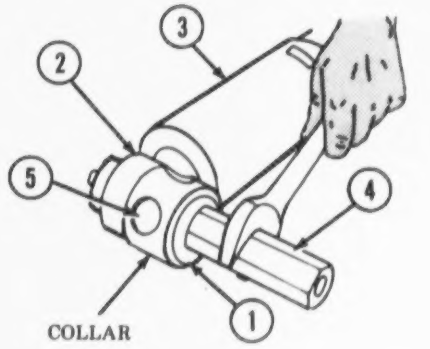
B Apply zinc chromate paste (item 46, Appx D) to mount (5) and install with four screws (14) and four flat washers (15). Torque screws to 90 lb-ft.

C Install retainer (13), new seal (12), shock absorber (6), new seal (10), washer (11) and retainer (9) on lower spindle/mount with nut (8). Torque nut to 100 lb-ft and install new cotter pin (7).

D Install shock absorber (6) on mount (5) with washer (3) and nut (2). Torque nut to 100 lb-ft and install new cotter pin (1).

TA312881

SHOCK ABSORBER BEARING: REMOVAL AND INSTALLATION



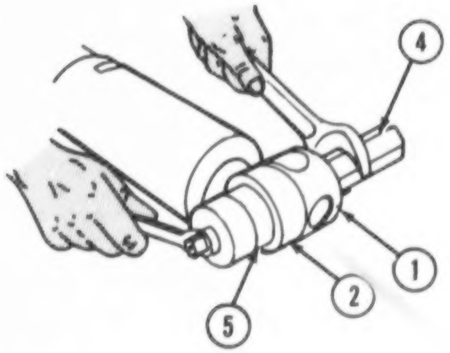
REMOVAL

A Install remover and replacer tool (1) in shock absorber eye (2) of shock absorber (3).

B Turn nut (4) clockwise to remove bearing (5). Discard bearing (5).

NOTE

Bearing is pulled into collar of remover.



INSTALLATION

A Remove stake marks and burrs from shock absorber eye using fine mill file or stone.

B Insert new bearing (5) by hand into shock absorber eye (2).

C Insert remover end replacer tool (1) through bearing (5).

D Turn nut (4) clockwise to insert bearing (5).

TA310171

Section III FINAL DRIVE AND UNIVERSAL JOINTS

This section contains instructions on how to remove, disassemble, assemble and install the final drive and universal joints. This section consists of the following:

- Final drive sprocket and hub
- Final drive assembly
- Transmission output flange
- Universal joints

The maintenance procedures are given under the following headings:

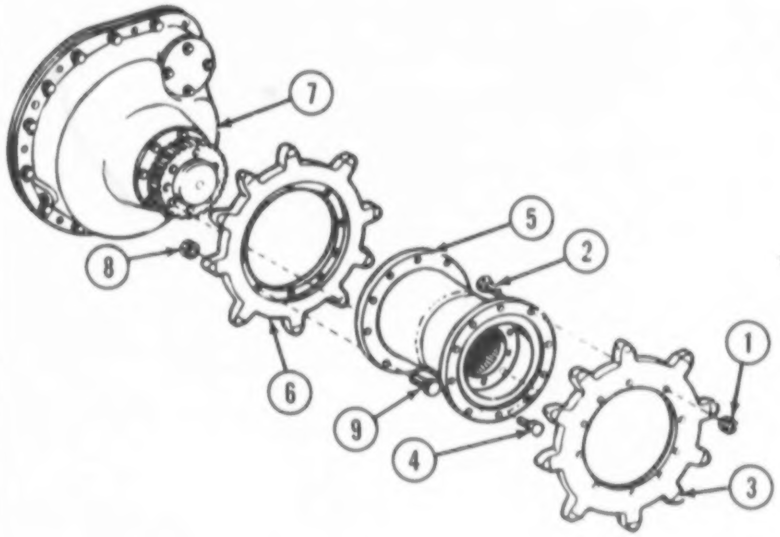
- Final drive sprocket and hub removal (p 8-28)
- Final drive assembly removal (p 8-29)
- Transmission output flange removal (p 8-36)
- Universal joints removal and disassembly (p 8-37)

FINAL DRIVE SPROCKET AND HUB: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Vehicle blocked.



REMOVAL

A Disconnect track (p 8-5).

B Remove 10 nuts (1), 10 screws (2), and outer sprocket (3).

WARNING

Hub is very heavy. Use at least two people when removing and installing.

NOTE

Hub with inner and outer sprockets attached may be removed as an assembly by removing eight screws (4).

C Remove eight screws (4), hub (5), and inner sprocket (6) from drive assembly (7).

D Insert two screws (4) in hub pilot holes. Tighten to pull hub away from drive assembly (7).

E Remove 10 nuts (8), 10 screws (9), and inner sprocket (6) from hub (5).

TA312882

FINAL DRIVE SPROCKET AND HUB: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Reverse removal procedures.

B Torque 10 screws (9) to 90 lb-ft.

C Torque eight screws (4) to 450 lb-ft.

D Torque 10 screws (2) to 90 lb-ft.

FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Pin, guide (item 3, Appx B)
Bolt, eye (item 1, Appx B)
Sling, lifting (item 4, Appx B)
Wrench, torque, 0-600 lb-ft (item 75, Appx B)

Materials/Parts:

Lubricating oil (item 32, Appx D)
Zinc chromate paste (item 46, Appx D)

Personnel Required:

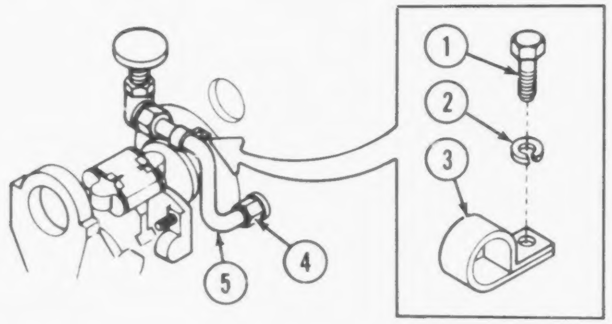
Two

References:

LO 9-2350-267-12

Equipment Conditions:

Vehicle parked and blocked.
Final drive sprocket and hub removed (p 8-28).



REMOVAL

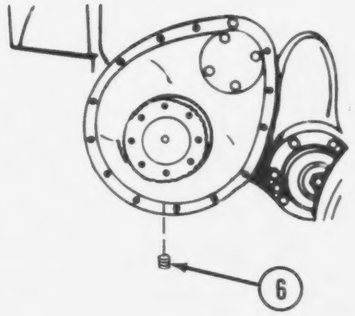
A Remove screw (1), lockwashers (2) and clamp (3). Discard lockwashers.

B Unscrew tube hexnut connector (4).

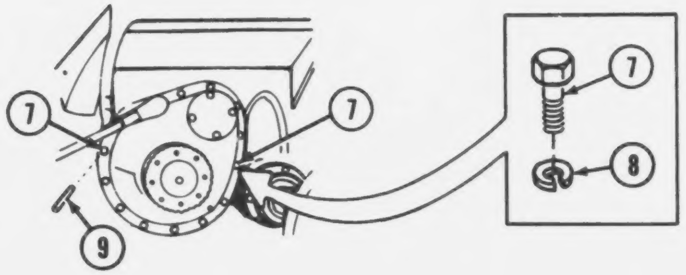
C Remove vent tube (5).

TA312883

FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



D Remove drain plug (6). Drain oil from final drive assembly into suitable container.

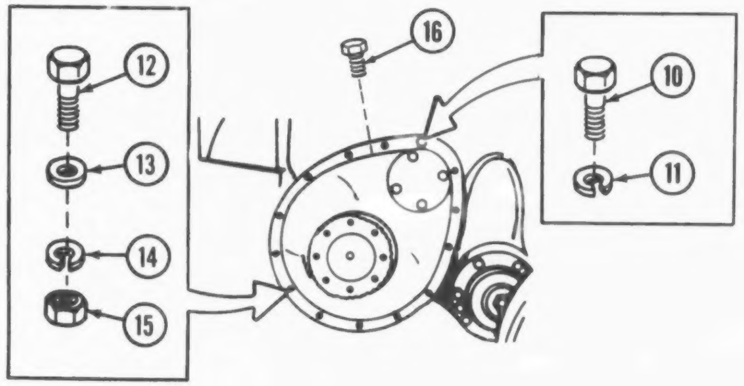


E Remove two screws (7) and two lockwashers (8). Discard lockwashers.

F Install two guide pins (9) in screw holes.

TA312884

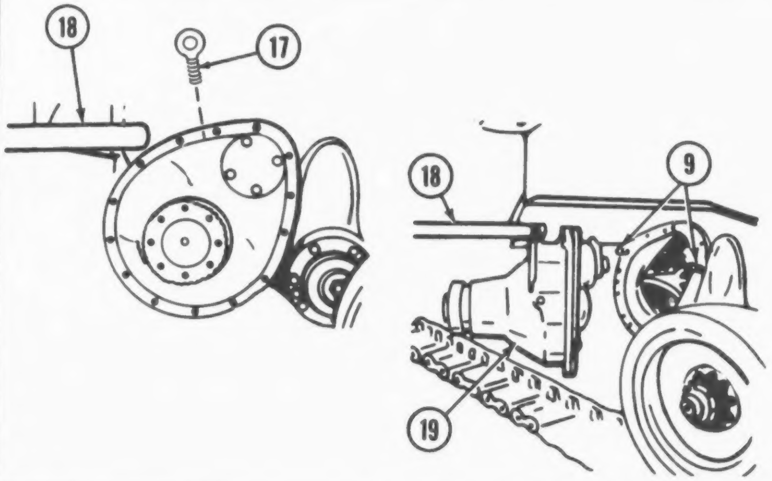
FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



G Remove seven screws (10) and seven lockwashers (11). Discard lockwashers.

H Remove five screws (12), five flat washers (13), five lockwashers (14) and five nuts (15). Discard lockwashers.

I Remove screw (16).



J Install lifting eye bolt (17).

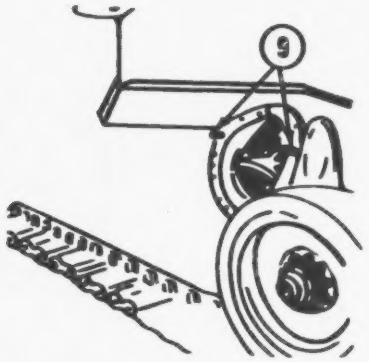
K Attach lifting sling (18) to lifting eye bolt (17) and to suitable lifting device.

L Remove final drive assembly (19) from vehicle. Place on suitable support and remove lifting sling (18).

M Remove two guide pins (9).

TA312885

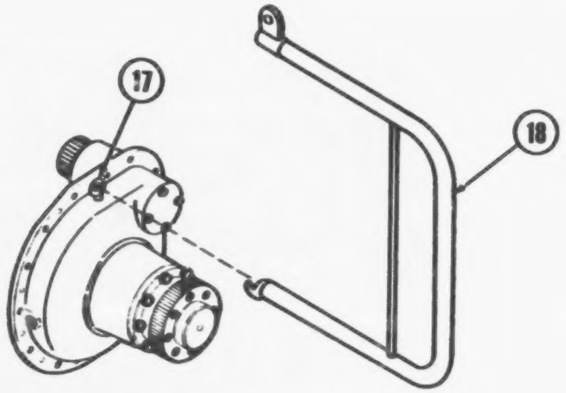
FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install two guide pins (9).

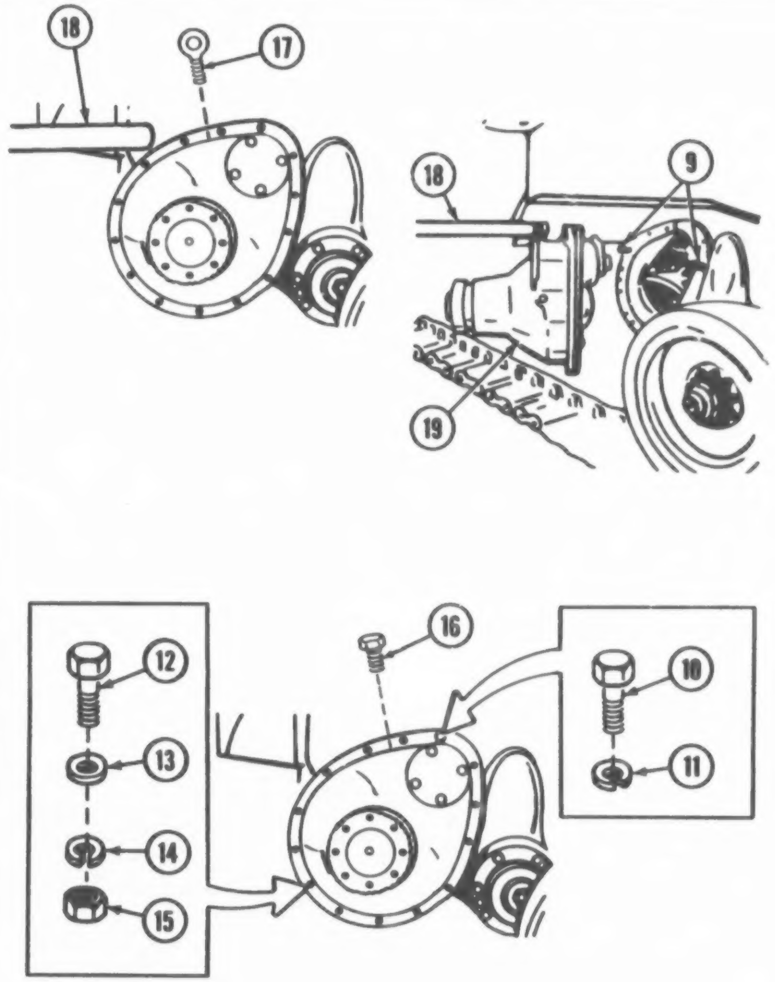
B Coat contact surfaces of hull and final drive assembly with zinc chromate paste (item 46, Appx D) before installation.



C Attach lifting sling (18) to lifting eye bolt (17) and to suitable lifting device.

TA312886

FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



D Position final drive assembly (19) against hull and secure with five screws (12), five flat washers (13), five new lockwashers (14) and five nuts (15).

E Install seven new lockwashers (11) and seven screws (10).

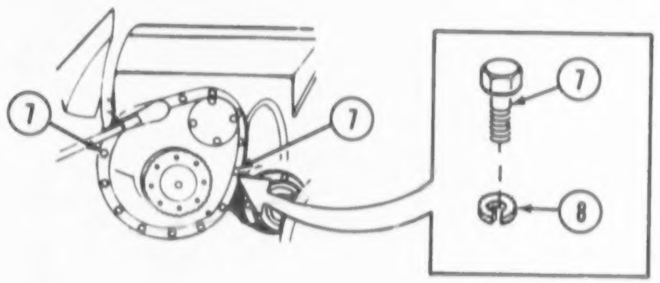
F Torque screws (10 and 12) to 290 lb-ft.

G Remove lifting device, lifting sling (18), lifting eye bolt (17) and guide pins (9).

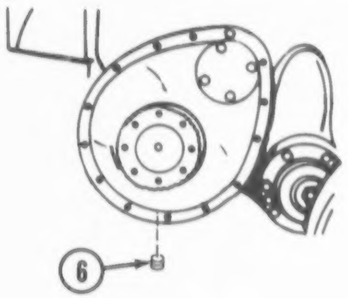
H Install screw (16).

TA312887

FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



I Install two new lockwashers (8) and two screws (7). Torque screws (7) to 290 lb-ft.

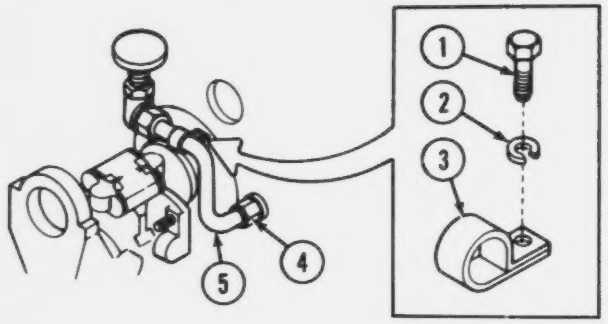


J Install drain plug (6).

K Fill final drive assembly with oil (LO 9-2350-267-12).

TA312888

FINAL DRIVE ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



L Position vent tube (5).

M Screw in vent tube hexnut connector (4).

N Secure upper end of vent tube (5) with clamp (3), new lockwasher (2) and screw (1).

TA312889

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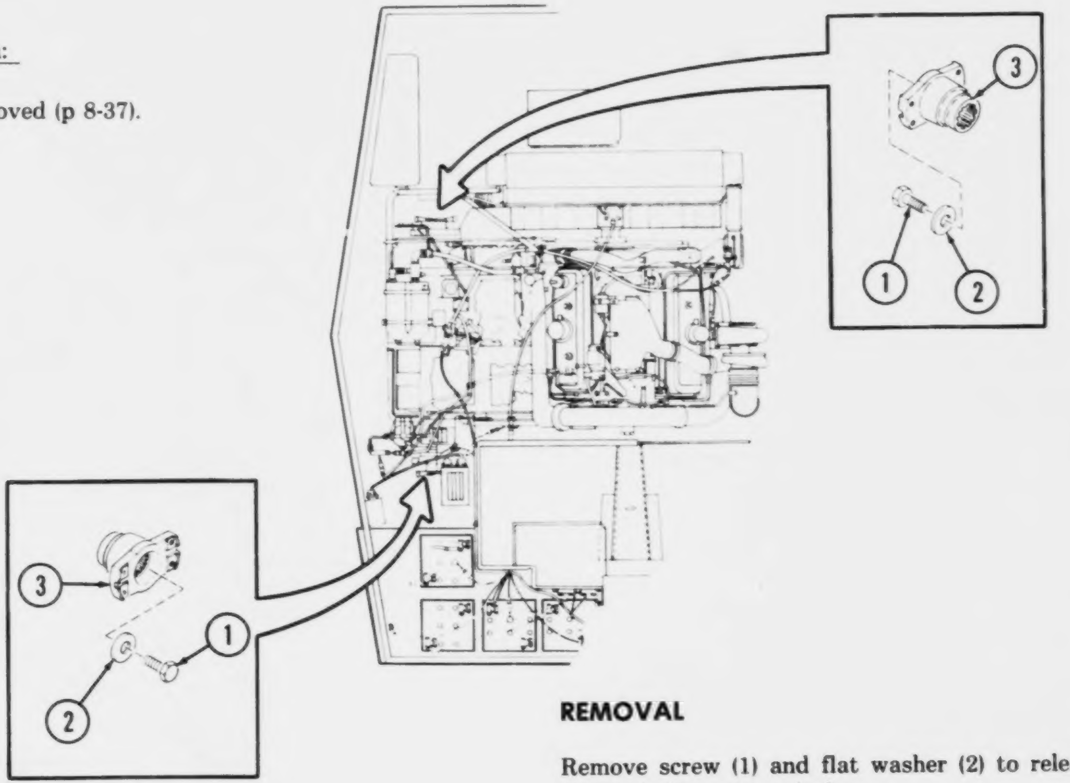
TRANSMISSION OUTPUT FLANGE: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Universal joints removed (p 8-37).



REMOVAL

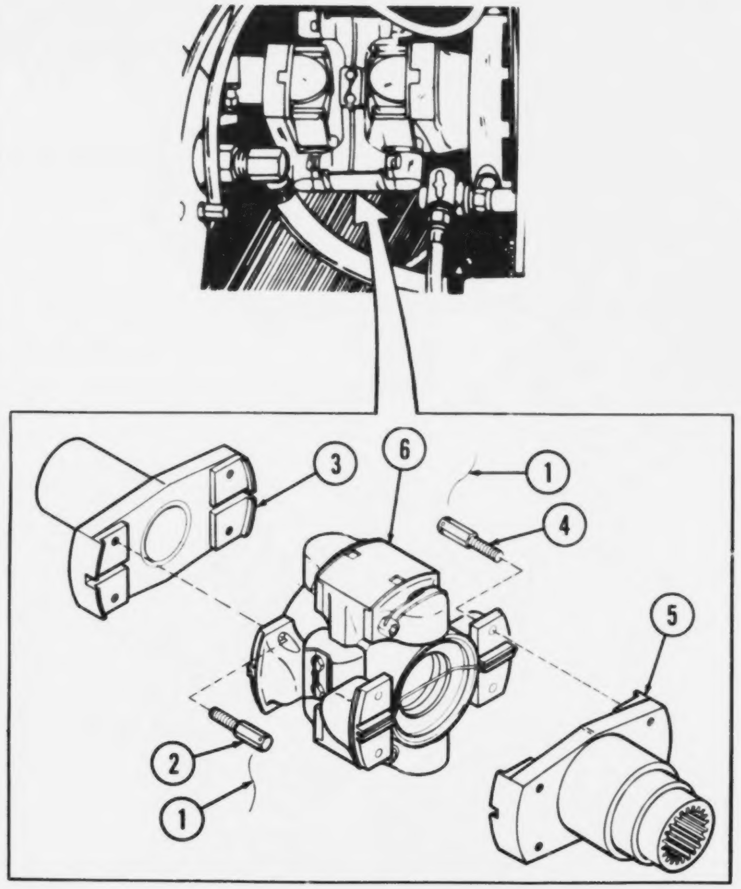
Remove screw (1) and flat washer (2) to release flange (3) from transmission output shaft.

INSTALLATION

Install flange (3) on transmission output shaft and secure with flat washer (2) and screw (1).

TA312890

UNIVERSAL JOINTS: REMOVAL, DISASSEMBLY INSPECTION AND REPAIR, ASSEMBLY AND INSTALLATION



INITIAL SETUP

Test Equipment/Special Tools:

Pliers, wire twisting (item 54, Appx B)

References:

LO 9-2350-267-12

Equipment Conditions:

Vehicle parked and blocked.

REMOVAL

A Open transmission access doors.

B Remove and discard lock wires (1).

NOTE

If flange screws are blocked, place transmission shift lever in neutral (N). Tow vehicle until screws are accessible. Reblock vehicle.

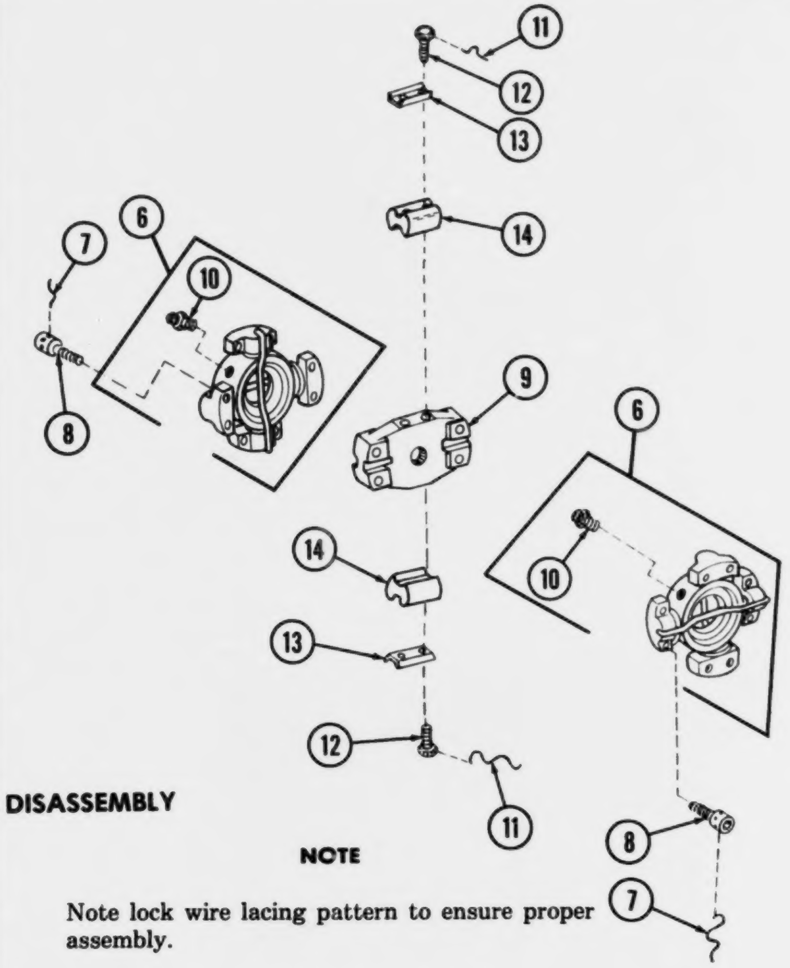
C **Remove four screws (2) at flange (3), and four screws (4) at flange (5).**

D **Push flange (3) toward final drive and flange (5) toward transmission.**

E **Lift spider assemblies (6) out of hull.**

TA312891

UNIVERSAL JOINTS: REMOVAL, DISASSEMBLY, INSPECTION AND REPAIR, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

NOTE

Note lock wire lacing pattern to ensure proper assembly.

A Remove and discard four lock wires (7).

B Remove eight screws (8).

C Separate two spider assemblies (6) from plate (9).

D Remove two lubrication fittings (10).

E Remove and discard two lock wires (11).

F Remove four screws (12), two retainers (13) and bumpers (14) from plate (9).

INSPECTION AND REPAIR

A Check two spider assemblies (6) for defects. Check for play between bearing caps and spider. Replace spider assembly if play is excessive.

B Inspect retainers (13) and bumpers (14) for deterioration, cracks, or distortion. Replace as necessary.

ASSEMBLY

A Position bumpers (14) and retainers (13) on plate (9).

B Install four screws (12).

C Install two new lock wires (11).

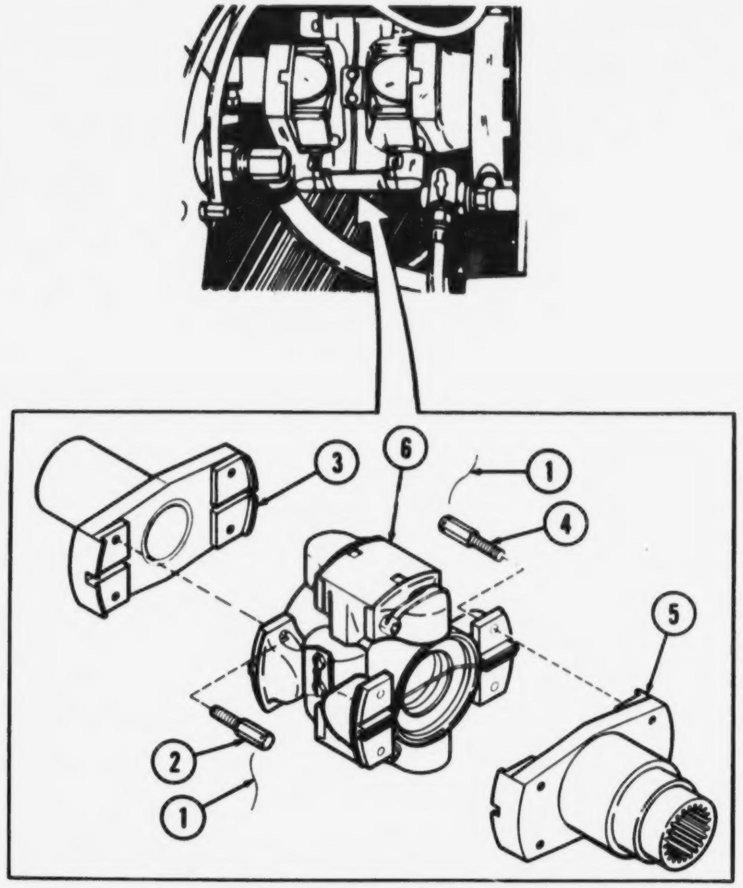
D Install two lubrication fittings (10).

E Secure one spider assembly (6) to each side of plate (9) with four screws (8).

F Install new lock wires (7).

TA312892

UNIVERSAL JOINTS: REMOVAL, DISASSEMBLY, INSPECTION AND REPAIR, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Position spider assemblies (6) on flange (5) and secure with four screws (4).

B Pull flange (3) into contact with spider assemblies (6) and secure with four screws (2).

C Install new lock wire (1) on screws (2 and 4).

D Lubricate universal joints (LO 9-2350-267-12).

E Close transmission access doors.

TA312893

CHAPTER 9
MAINTENANCE PROCEDURES: HULL RELATED COMPONENTS

CHAPTER OVERVIEW

This chapter contains illustrated maintenance procedures for removal, disassembly, assembly, installation and adjustment of hull related components.

Section I	Driver's, Commander's and Crew Seat Assemblies
Section II	Hatches, Latches, Locks and Covers
Section III	Doors
Section IV	Front Fenders, Rear Track Splash Guards and Towing Pintle
Section V	Telephone Hand Reel
Section VI	Machine Gun Mount—M2
Section VII	Deleted

Section I DRIVER'S, COMMANDER'S AND CREW SEAT ASSEMBLIES

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

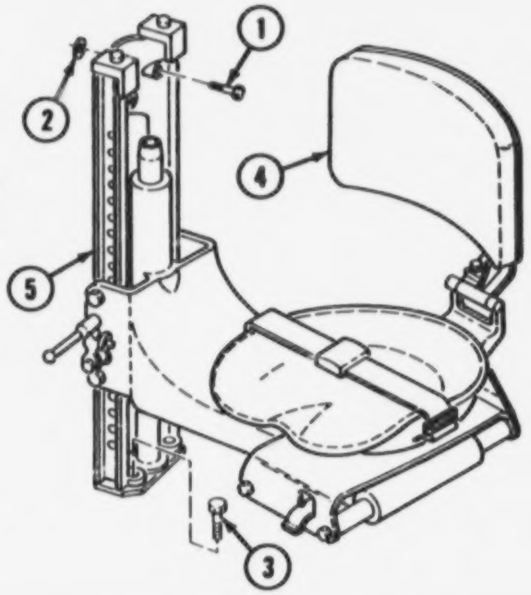
INITIAL SETUP

Materials/Parts:

Sealing compound (item 52, Appx D)

Personnel Required:

Two



REMOVAL

A Open and secure driver's hatch.

WARNING

Driver's seat is spring loaded. DO NOT raise adjusting lever without controlling seat.

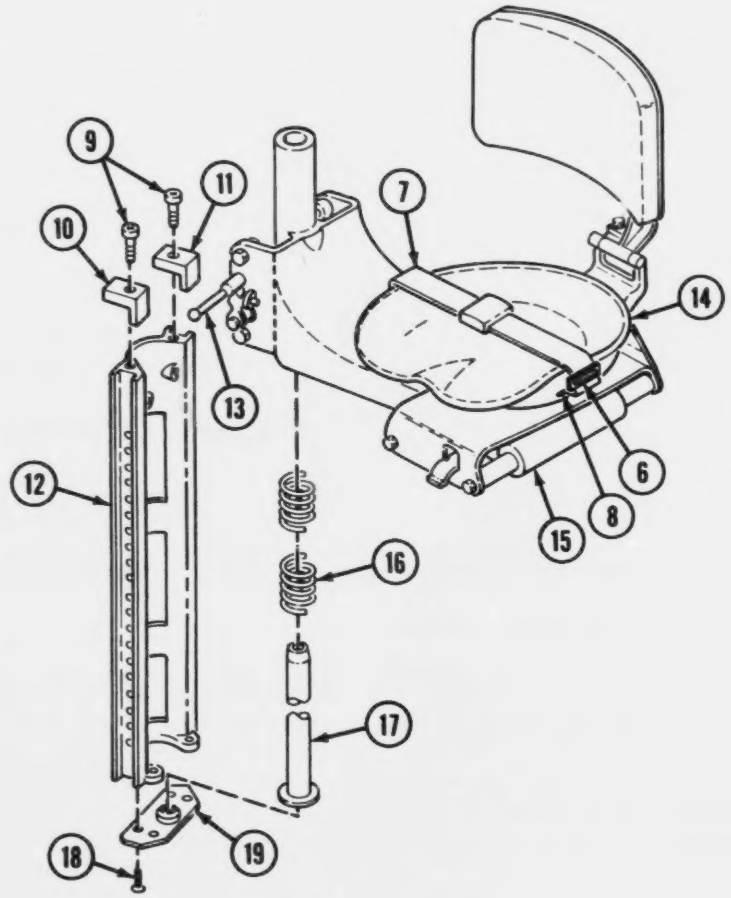
B Remove two screws (1) and two washers (2).

C Remove two screws (3).

D With assistant, lift seat assembly (4) including vertical support assembly (5) out of vehicle.

TA57244

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove slide (6) and pull ends of safety belt (7) through seat loops (8).

B Remove two screws (9) releasing two pads (10 and 11) from vertical support (12).

WARNING

Driver's seat is spring loaded. DO NOT raise adjusting lever without controlling seat.

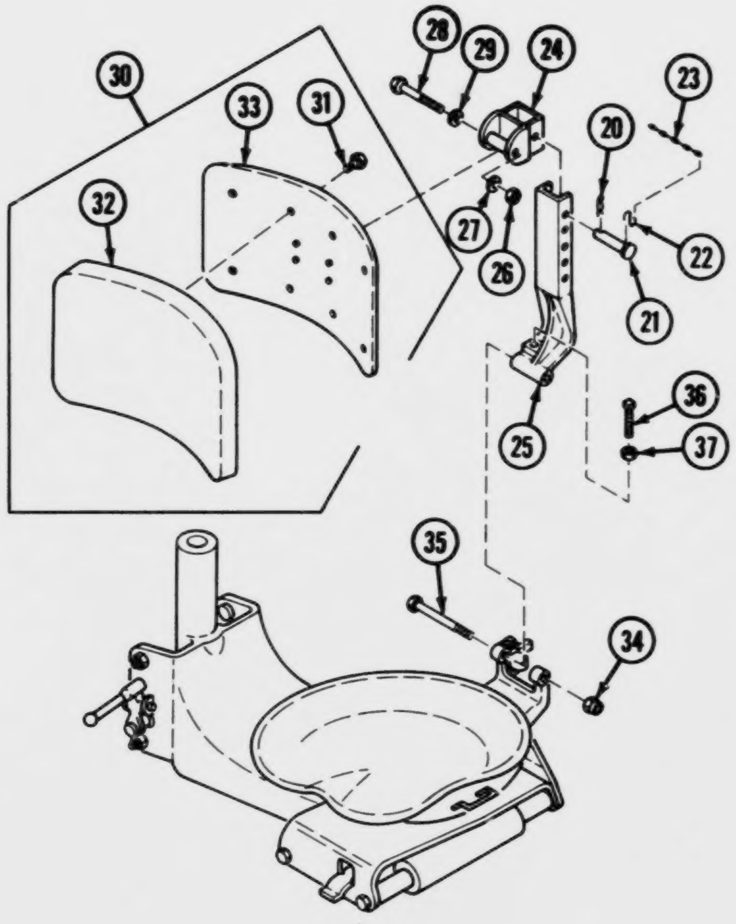
C Have assistant lift adjusting lever (13) releasing seat assembly (14) and seat support assembly (15) from vertical support (12).

D Lift spring (16) from vertical guide (17).

E Remove two screws (18) releasing base plate (19) from vertical support (12).

TA57245

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



F Remove lockpin (20), headed pin (21), hook (22) and chain (23) from bracket (24). Disconnect bracket (24) from backrest support (25). Discard lockpin.

G Remove self-locking nut (26), flat washer (27), screw (28), flat washer (29) and bracket (24) from seat back cushion assembly (30). Discard self-locking nut.

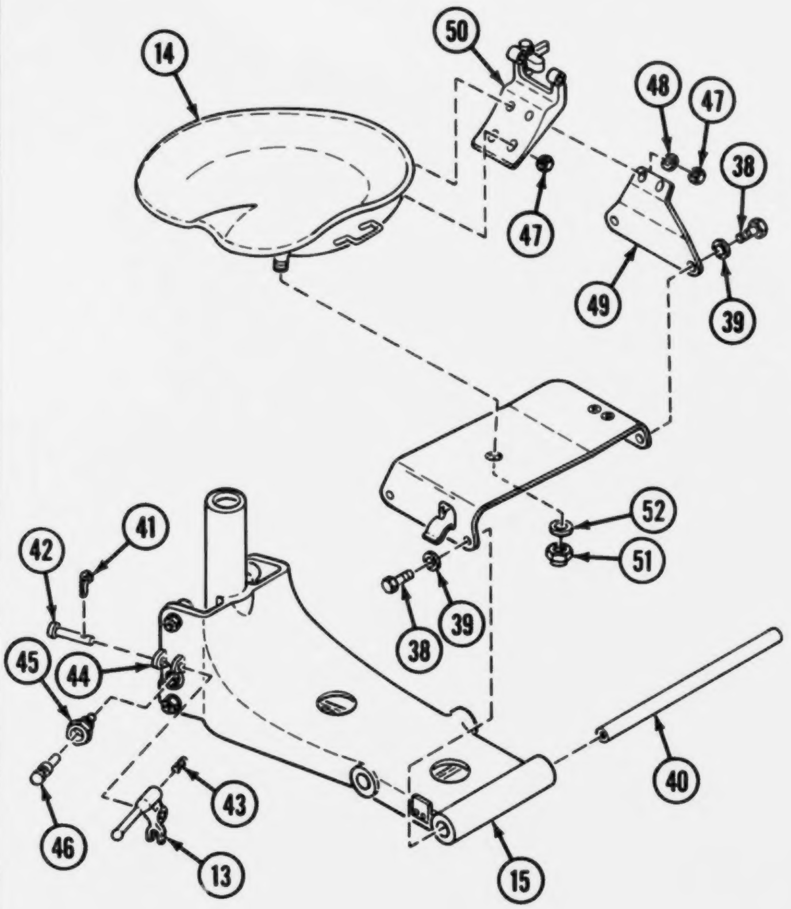
H Remove eight screws (31) and separate backrest cushion (32) from seat back cushion support (33).

I Remove self-locking nut (34), screw (35) and backrest support (25). Discard self-locking nut.

J Remove setscrew (36) and nut (37) from backrest support (25).

TA57246

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



K Remove four screws (38), four flat washers (39), two shafts (40) and seat support assembly (15) from seat assembly (14).

L Remove cotter pin (41), headed pin (42), spring (43) and lift adjusting lever (13) from vertical seat support assembly (44). Discard cotter pin.

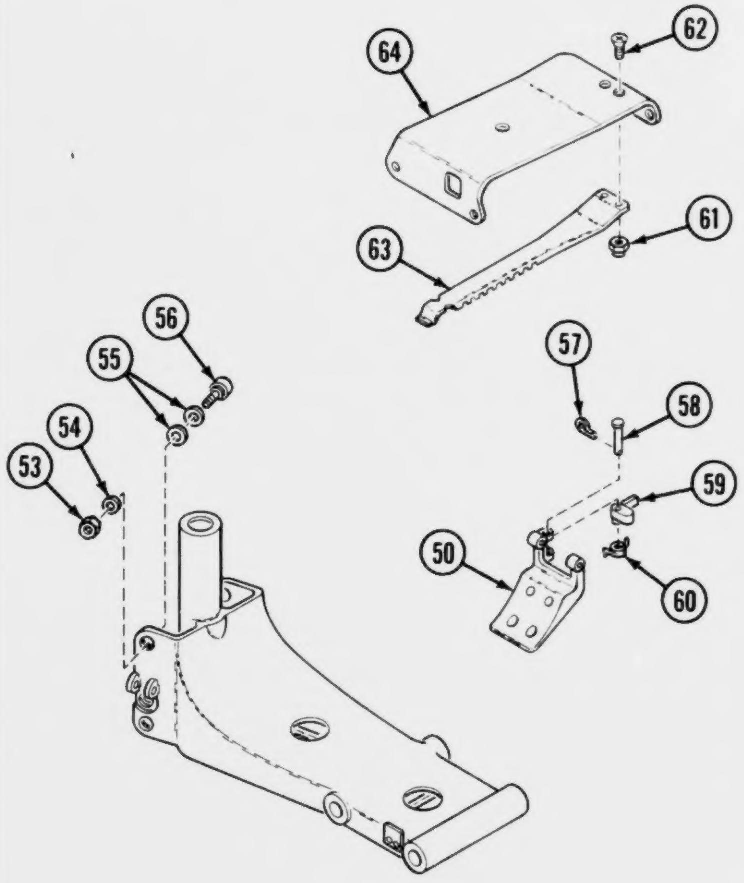
M Remove threaded bushing (45) and plunger (46).

N Remove four self-locking nuts (47), two flat washers (48), and reinforcement bracket (49). Remove seat back bracket (50) from seat assembly (14). Discard self-locking nuts.

O Remove self-locking nut (51) and flat washer (52) from seat assembly (14). Remove seat assembly (14). Discard self-locking nut.

TA57247

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



P Remove four self-locking nuts (53), four flat washers (54), shims (55) and four cam followers (56). Discard self-locking nuts.

Q Remove cotter pin (57), headed pin (58), pawl (59) and spring (60) from seat back bracket (50). Discard cotter pin.

R Remove two self-locking nuts (61), two screws (62) and adjusting lever (63) from bracket (64). Discard self-locking nuts.

ASSEMBLY

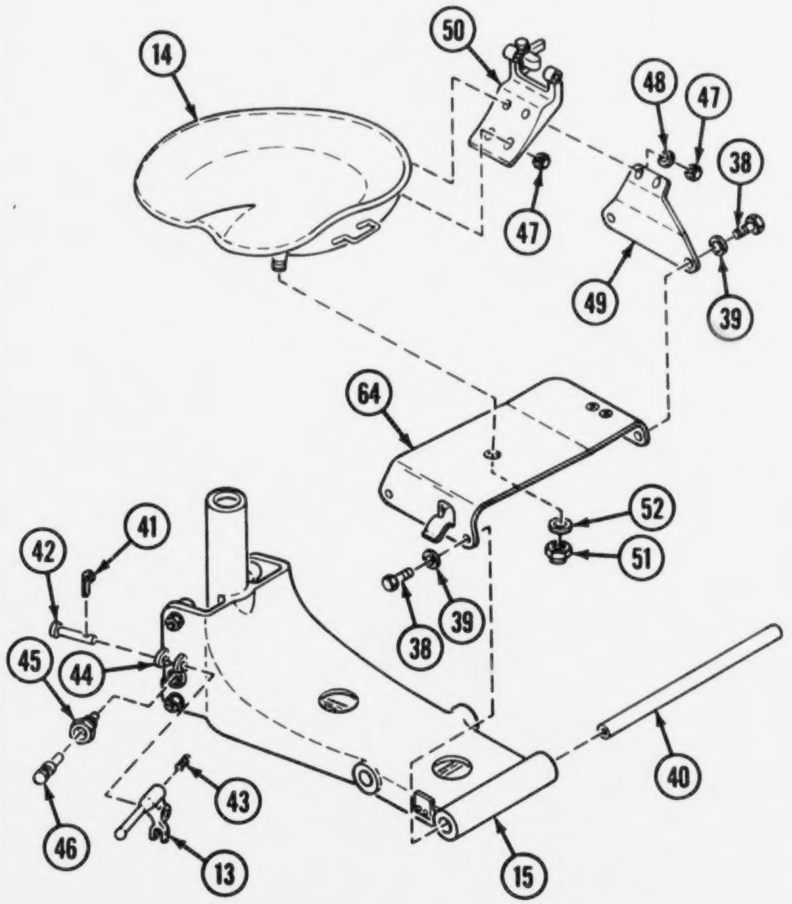
A Position adjusting lever (63) under bracket (64) and install two screws (62) and two new self-locking nuts (61).

B Install spring (60) and pawl (59) on seat back bracket (50) with headed pin (58) and new cotter pin (57).

C Install four cam followers (56) and shims (55) with four flat washers (54) and four new self-locking nuts (53).

TA57248

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



D Install seat assembly (14) on bracket (64) with flat washer (52) and new self-locking nut (51).

E Install seat back bracket (50) on seat assembly (14) with two new self-locking nuts (47).

F Install reinforcement bracket (49) on bracket (50) and seat assembly (14) with two flat washers (48) and two new self-locking nuts (47).

G Lightly coat threads of threaded bushing (45) with sealing compound (item 52, Appx D). Install sleeve (45) and plunger (46).

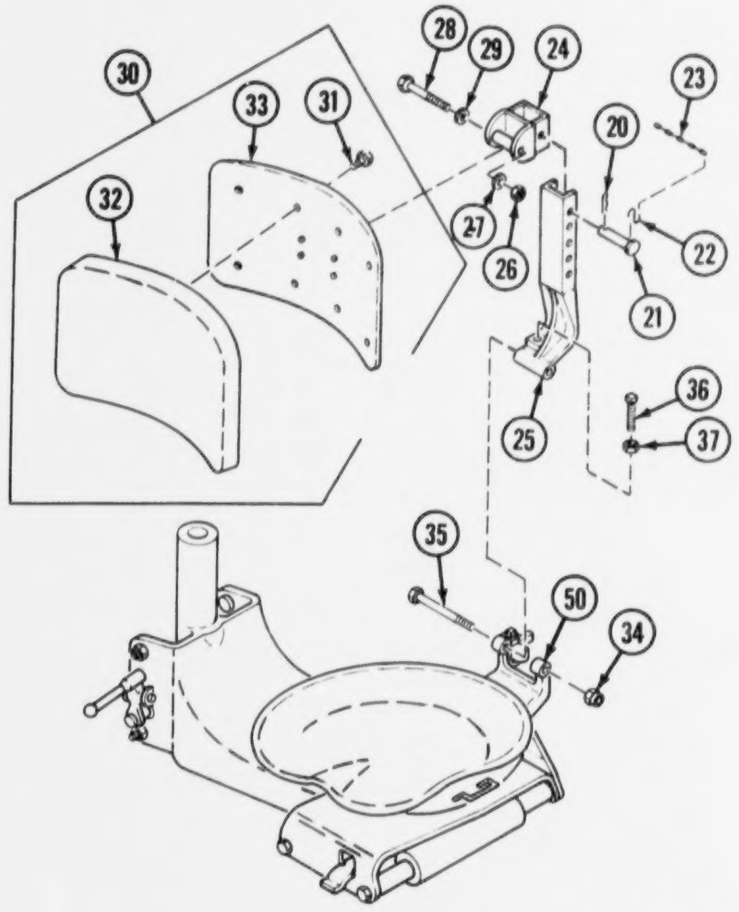
H Install adjusting lever (13) and spring (43) in seat support assembly (44) with headed pin (42) and new cotter pin (41).

I Insert two shafts (40) in seat support assembly (15) and install seat assembly (14) and bracket (64) with four flat washers (39) and four screws (38).

J Lightly coat threads of four screws (38) with sealing compound (item 52, Appx D).

TA57249

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



K Install nut (37) and setscrew (36) in backrest support (25).

L Install backrest support (25) on bracket (50) with screw (35) and new self-locking nut (34).

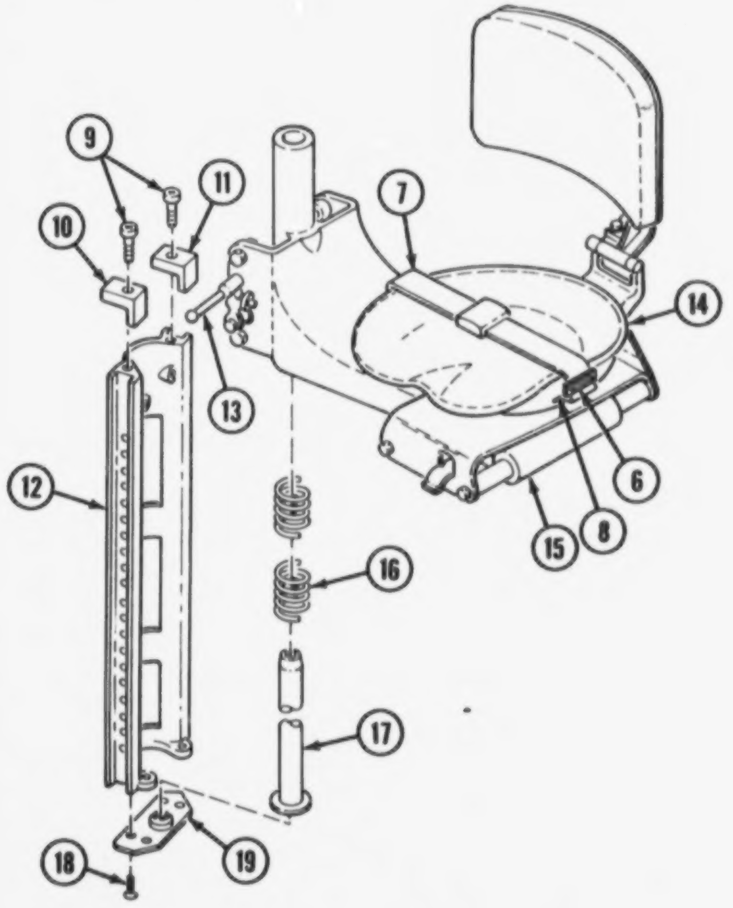
M Install backrest cushion (32) on seat back cushion support (33) with eight screws (31).

N Install seat back cushion assembly (30) on bracket (24) with screw (28), flat washers (27 and 29) and new self-locking nut (26).

O Install hook (22) and chain (23) on headed pin (21) and new lockpin (20). Install bracket (24) and backrest support (25), headed pin (21) and new lockpin (20).

TA57250

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



P Lightly coat threads of two screws (18) with sealing compound (item 52, Appx D). Install baseplate (19) on bottom of vertical support (12) with two screws (18).

Q Install spring (16) over vertical guide (17).

R With assistant, install seat assembly (14) and seat support assembly (15) on vertical support (12). Check for free travel and firm locking in various positions by adjusting lever (13). Correct travel binding or looseness by removing or installing shims (55) under cam followers (56). (Refer to Assembly, step C).

S Install two pads (10 & 11) at top of vertical support (12) with two screws (9).

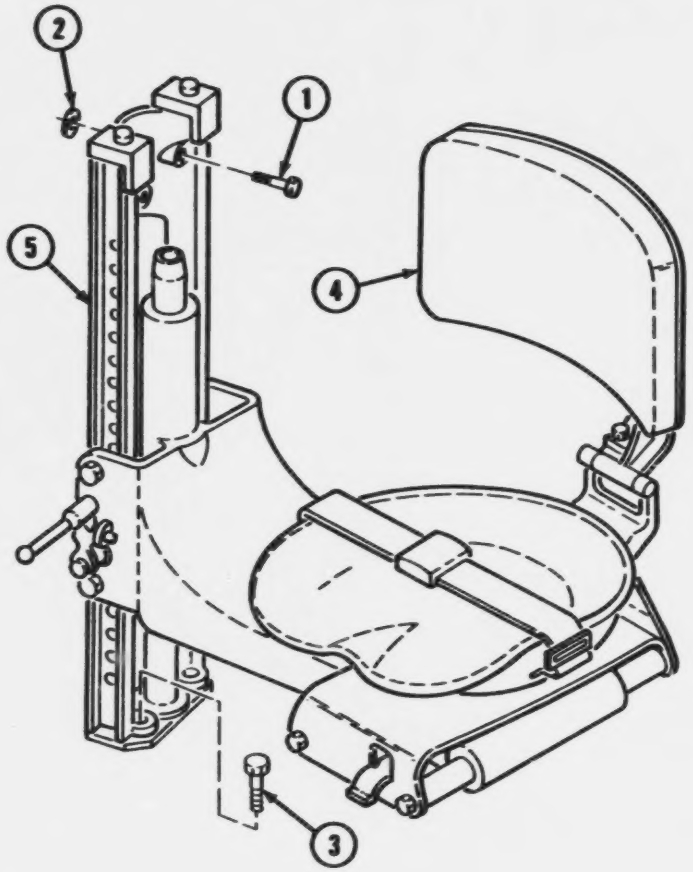
WARNING

Do not trim ends of belt. Insufficient belt length could endanger personnel.

T Thread free ends of safety belt (7) through slide (6), seat loops (8) and across top of loops, and secure.

TA57253

DRIVER'S SEAT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Lightly coat threads of two screws (1) and two screws (3) with sealing compound (item 52, Appx D).

WARNING

Driver's seat is spring loaded. DO NOT raise adjusting lever without controlling seat.

B With assistant, lift seat assembly (4) including vertical support (5) in to vehicle.

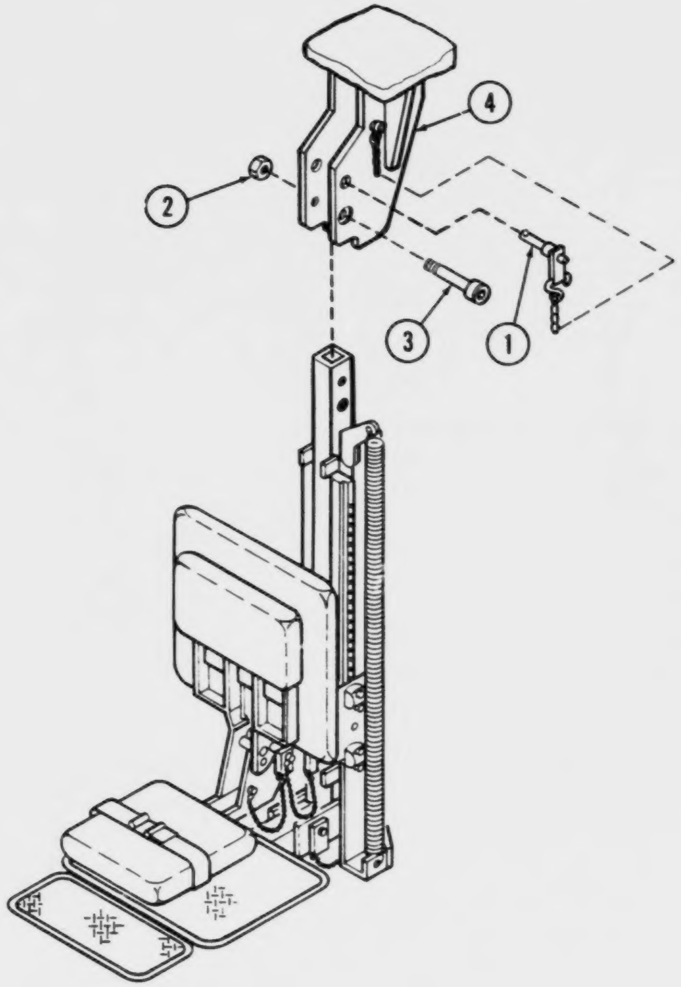
C Install two screws (3).

D Install two screws (1) and two washers (2).

E Close driver's hatch.

TA57254

COMMANDER'S SEAT: REMOVAL AND INSTALLATION



REMOVAL

WARNING

The commander's seat assembly is heavy. Three personnel are required to remove seat assembly from vehicle ceiling.

NOTE

Deploy commander's seat. Raise seat carriage to maximum UP position to relieve spring tension (TM 9-2350-267-10).

A Pull quick-release pin (1).

B Remove nut (2) from screw (3). With two personnel supporting seat assembly, remove screw (3).

C Remove seat assembly from vehicle ceiling bracket (4).

INSTALLATION

Reverse removal procedures.

TA309992

COMMANDER'S SEAT CARRIAGE: DISASSEMBLY AND ASSEMBLY

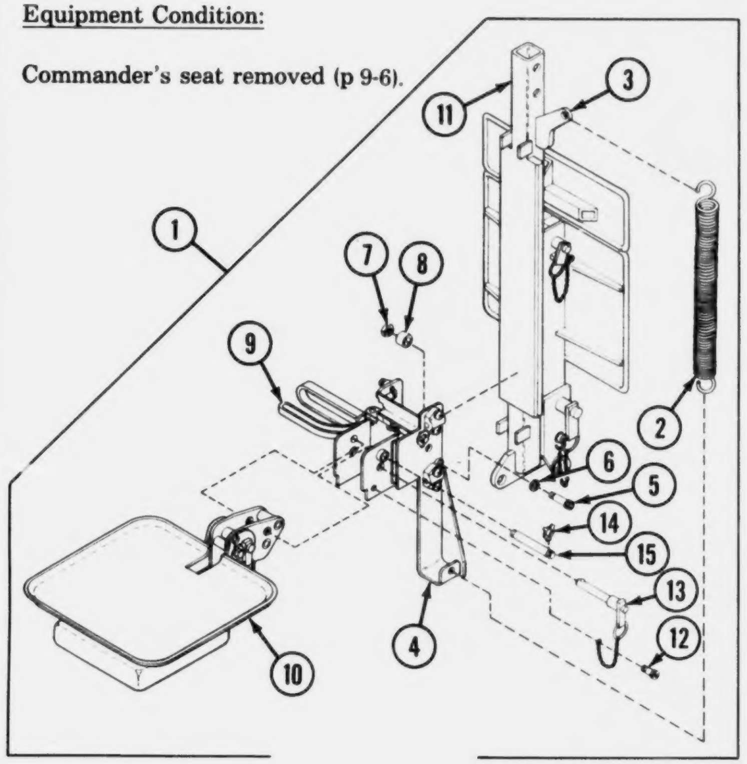
INITIAL SETUP

Personnel Required:

Two

Equipment Condition:

Commander's seat removed (p 9-6).



DISASSEMBLY

A Place seat assembly (1) on suitable work surface with spring (2) parallel to surface.

B Remove spring (2) from post bracket (3) and carriage (4).

C Remove four shouldered screws (5), four lockwashers (6), four locknuts (7) and four cam followers (8). Discard lockwashers and locknuts.

WARNING

Have assistant support weight of seat and carriage.

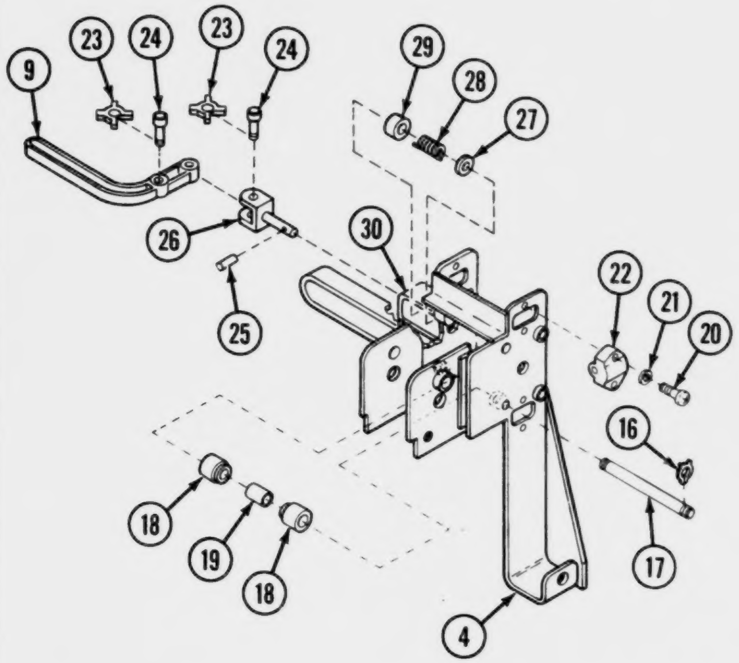
D Press locking handle (9) and remove carriage (4) and seat (10) from post (11).

E Remove screw (12) and quick-release pin (13).

F Remove two washers (14) and shaft (15). Separate carriage (4) and seat (10).

TA312903

COMMANDER'S SEAT CARRIAGE: DISASSEMBLY AND ASSEMBLY (CONTINUED)



G Remove four washers (16), two shafts (17), four cam followers (18) and two spacers (19).

H Remove eight screws (20), eight lockwashers (21) and four roller assemblies (22). Discard lockwashers.

I Remove two washers (23), two headed pins (24) and handle (9).

J Drive out grooved pin (25) and remove pin assembly (26), washer (27), spring (28) and sleeve (29) from carriage (4).

ASSEMBLY

A Insert pin assembly (26) into hole in pin housing (30).

B Place sleeve (29) spring (28) and washer (27) in pin housing (30). Install pin assembly (26) and secure with grooved pin (25).

C Install handle (9) with two headed pins (24) and two washers (23).

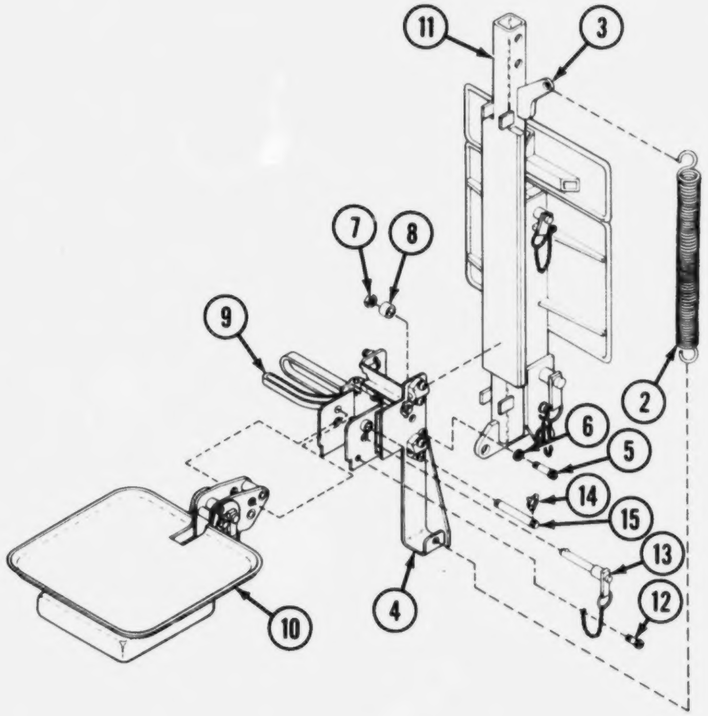
D Install each of four roller assemblies (22) with two screws (20) and two new lockwashers (21).

E Install four cam followers (18) separated by two spacers (19) on two shafts (17).

F Secure two shafts (17) in carriage (4) with four washers (16).

TA312904

COMMANDER'S SEAT CARRIAGE: DISASSEMBLY AND ASSEMBLY (CONTINUED)



G Install seat (10) on carriage (4) with shaft (15) and two washers (14).

H Install quick-release pin (13) and chain on carriage (4) with screw (12). Insert quick-release pin (13).

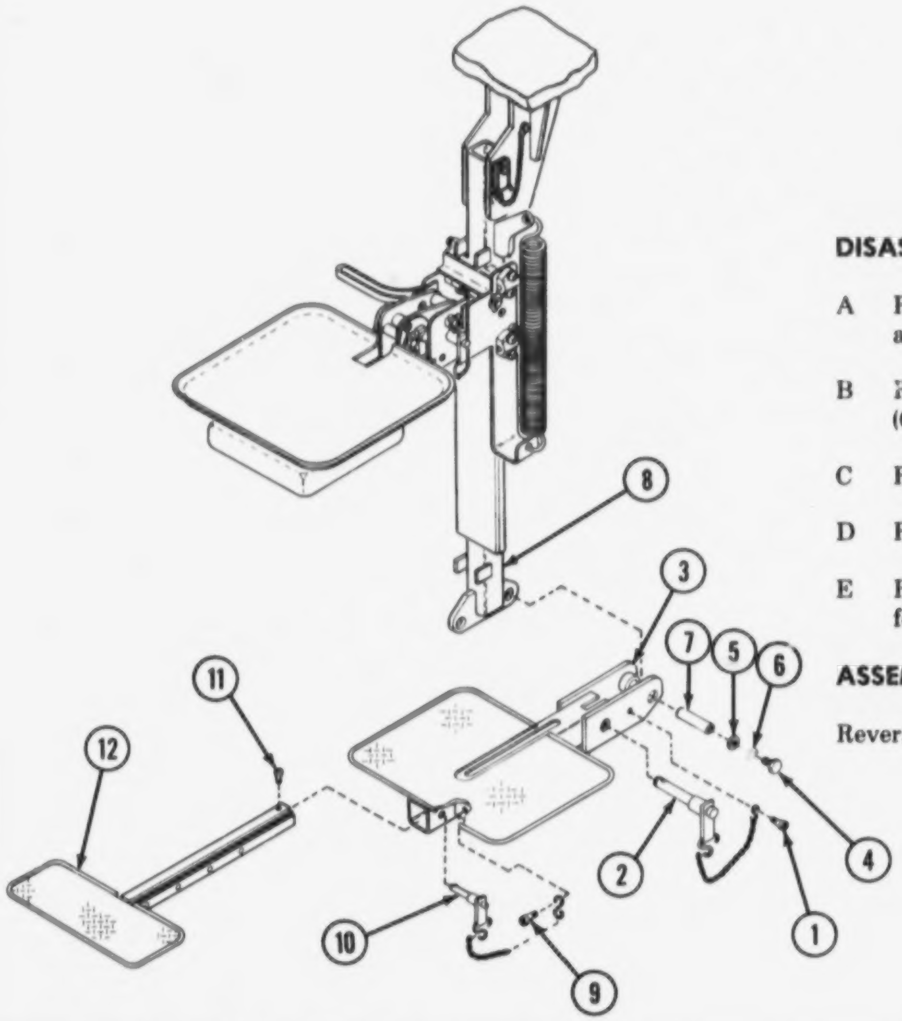
I Press locking handle (9). Install carriage (4) and seat (10) on post (11). Release locking handle (9).

J Install four shouldered screws (5), four new lockwashers (6), four cam followers (8) and four new locknuts (7).

K Move seat (10) and carriage (4) to highest position on post (11). Install spring (2) on carriage (4) and post bracket (3).

TA312905

COMMANDER'S SEAT POST AND FOOTREST: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove screw (1) and quick-release pin (2) from footrest assembly (3).

B Remove two screws (4), two flat washers (5), two lockwashers (6) and pin (7).

C Remove footrest assembly (3) from post (8).

D Remove screw (9) and quick-release pin (10).

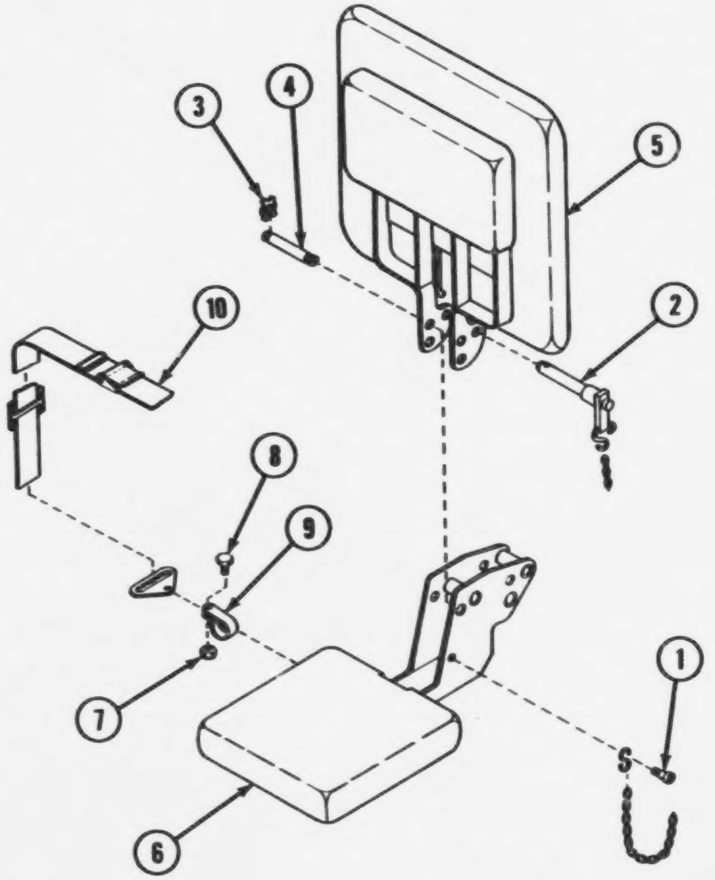
E Remove screw (11) and pull footrest extension (12) from footrest assembly (3).

ASSEMBLY

Reverse disassembly procedures.

TA309995

COMMANDER'S SEAT: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove commander's seat assembly from carriage (p 9-7).

B Remove screw (1) and quick-release pin (2).

C Remove two washers (3) and shaft (4), and separate backrest (5) and seat (6).

D Remove two nuts (7), two screws (8) and two clamps (9).

E Remove belt (10).

ASSEMBLY

Reverse disassembly procedures.

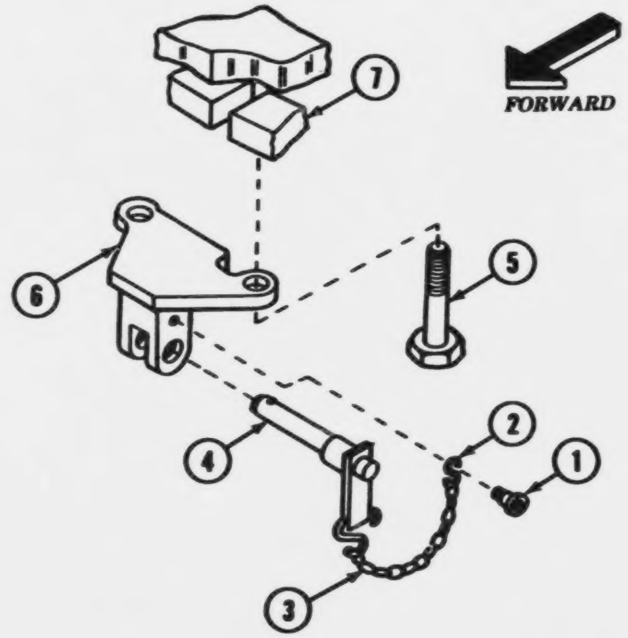
TA309996

■ COMMANDER'S SEAT CEILING BRACKET SUPPORT, FORWARD: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Commander's seat deployed (TM 9-2350-267-10).



REMOVAL

A Remove screw (1), S-hook (2), chain (3), and quick-release pin (4).

B Remove two self-locking bolts (5) and forward support bracket (6) from commander's cupola ring (7). Discard self-locking bolts.

INSTALLATION

A Install forward support bracket (6) on commander's cupola ring (7) with two new self-locking bolts (5).

B Install quick-release pin (4), chain (3), S-hook (2), and screw (1).

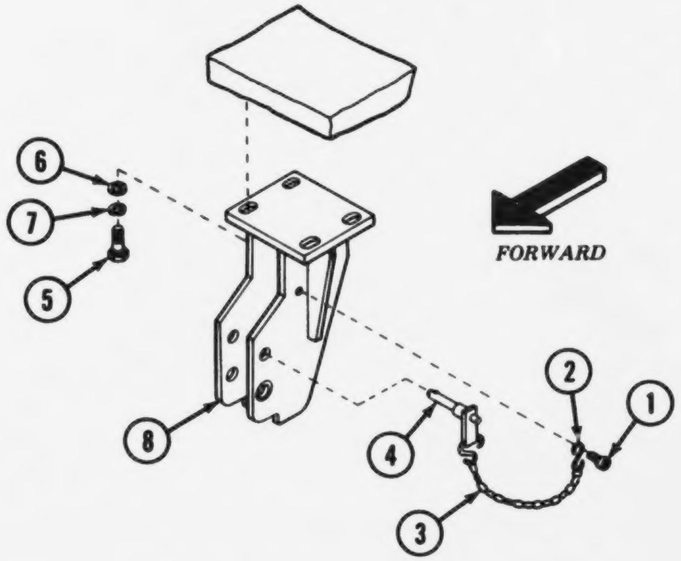
TA58036

COMMANDER'S SEAT CEILING BRACKET SUPPORT, REAR: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Commander's seat removed (p 9-6).



REMOVAL

A Remove screw (1), S-hook (2), chain (3), and quick-release pin (4).

B Remove four screws (5), four flat washers (6), four lockwashers (7) and rear support bracket (8) from vehicle ceiling. Discard lockwashers.

INSTALLATION

A Install rear support bracket (8) with four new lockwashers (7), four flat washers (6), and four screws (5).

B Install quick-release pin (4), chain (3), S-hook (2), and screw (1).

TA57255

CREW SEATS (RIGHT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

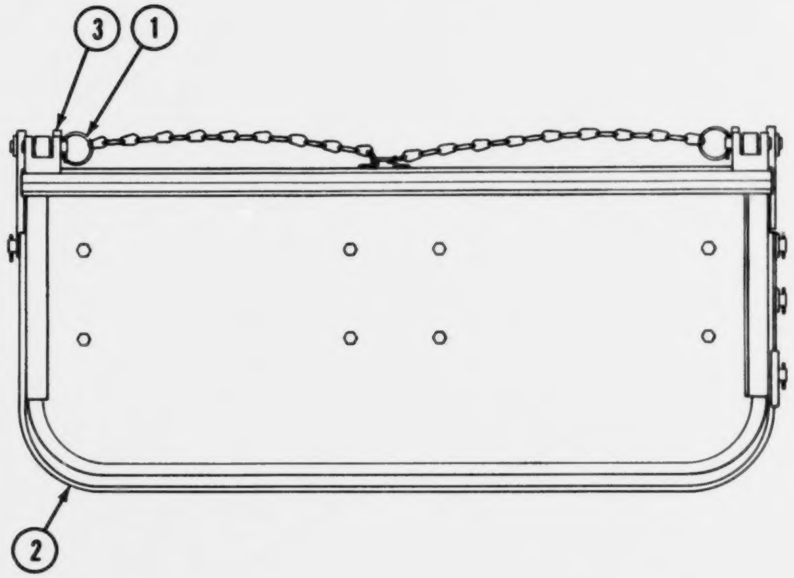
INITIAL SETUP

Personnel Required:

Two

WARNING

Seats are heavy. Support seats before pulling quick-release pins. Hinged seats, backrests and support brackets may swing down, causing personal injury.



DOUBLE SEAT

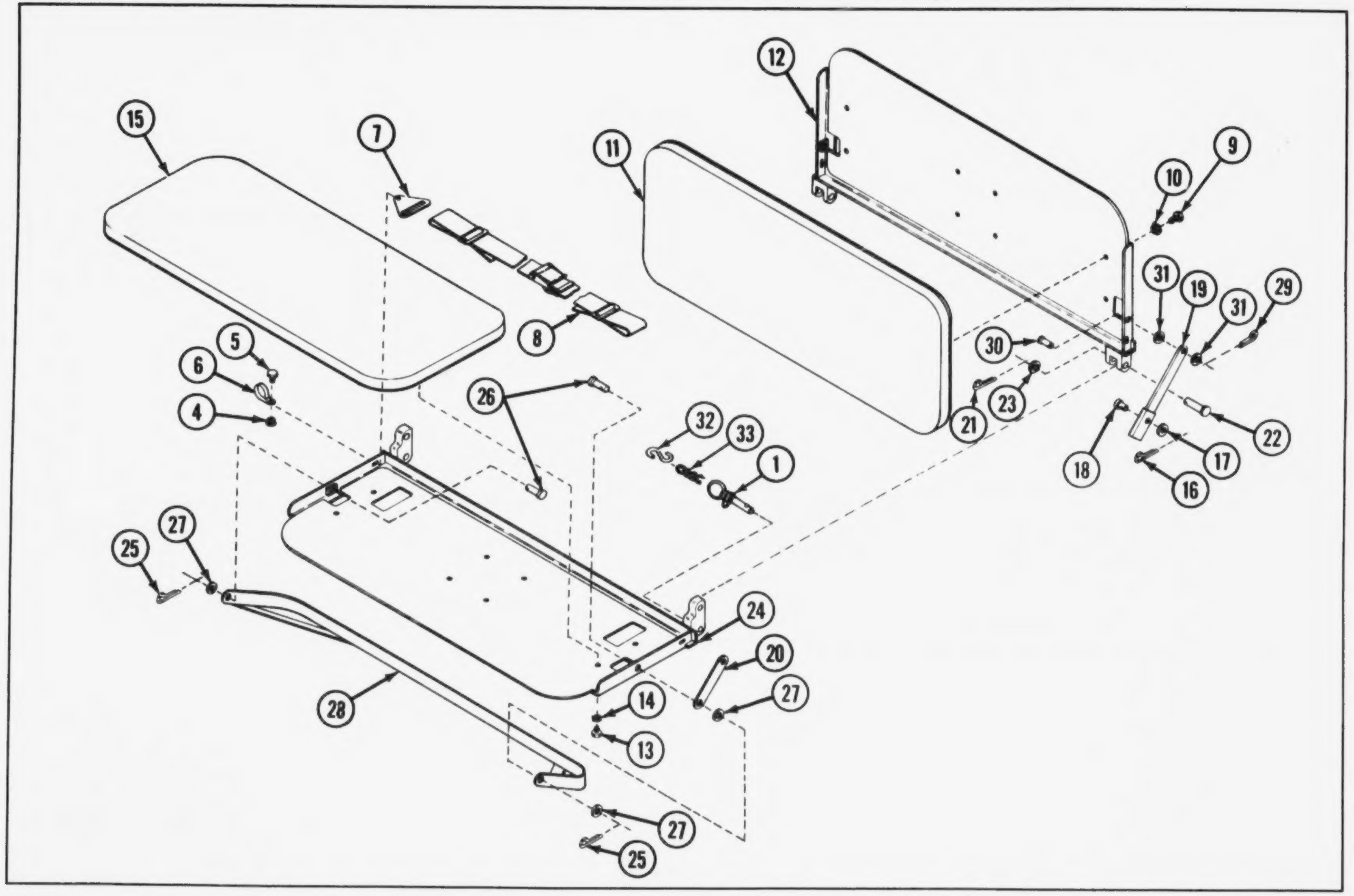
REMOVAL

A Remove quick-release pins (1) which secure seat (2) to left-hand sponson (3).

B Place seat (2) on clean flat surface.

TA57466

CREW SEATS (RIGHT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)


12
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25

TA57467

CREW SEATS (RIGHT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

A Remove two self-locking nuts (4), two screws (5), two clamps (6), two plates (7) and safety belt assembly (8). Detach ends of safety belt assembly (8) from slotted ends of plates (7). Discard self-locking nuts.

B Remove eight screws (9), eight lockwashers (10) and backrest cushion assembly (11) from backrest (12). Discard lockwashers.

C Remove eight screws (13), eight lockwashers (14) and seat cushion assembly (15). Discard lockwashers.

D Remove two cotter pins (16), two washers (17) and two headed pins (18), and separate levers (19) from links (20). Discard cotter pins.

E Remove two cotter pins (21), two headed pins (22) and two washers (23). Separate backrest assembly (12) from seat assembly (24). Discard cotter pins.

F Remove two cotter pins (25), two headed pins (26), three flat washers (27), bracket assembly (28) and links (20). Discard cotter pins.

G Remove two cotter pins (29), two headed pins (30), four flat washers (31) and two link levers (19) from backrest assembly (12). Discard cotter pins.

H Remove two S-hooks (32), releasing two chains (33) and two quick-release pins (1).

ASSEMBLY

A Install two S-hooks (32) on cleat on backside of seat assembly (12) with two chains (33) and two quick-disconnect pins (1).

B Install two levers (19) and four flat washers (31) on backrest assembly (12) with two headed pins (30) and two new cotter pins (29).

C Install bracket assembly (28) and two links (20) on seat assembly (24) with two headed pins (26), three flat washers (27) and two new cotter pins (25).

D Install backrest assembly (12) on seat assembly (24) with two headed pins (22), two washers (23) and two new cotter pins (21).

E Install links (20) on levers (19) with two headed pins (18), two washers (17) and two new cotter pins (16).

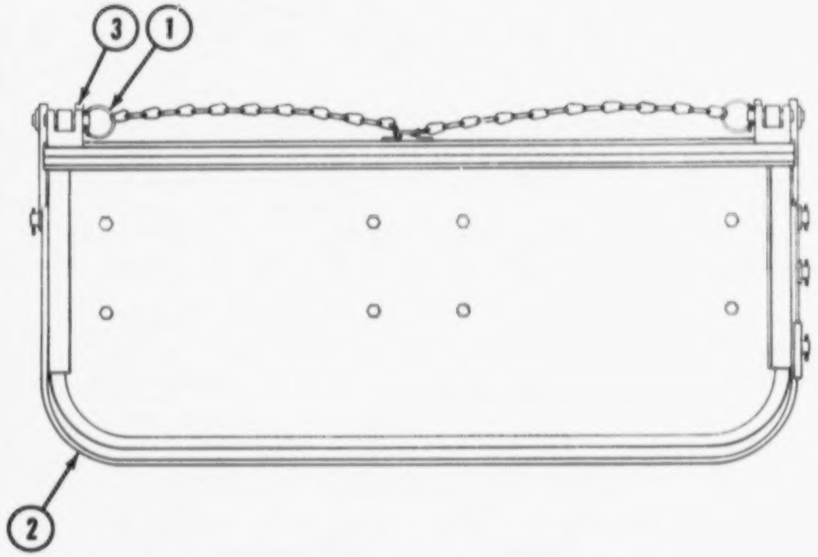
F Install seat cushion assembly (15) on seat assembly (24) with eight new lockwashers (14) and eight screws (13).

G Install backrest cushion assembly (11) on backrest assembly (12) with eight new lockwashers (10) and eight screws (9).

H String ends of safety belt (8) through slotted ends of two plates (7). Secure pointed ends of plates (7) to frame of seat assembly (24) with two clamps (6), two screws (5) and two new self-locking nuts (4).

TA57468

CREW SEATS (RIGHT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

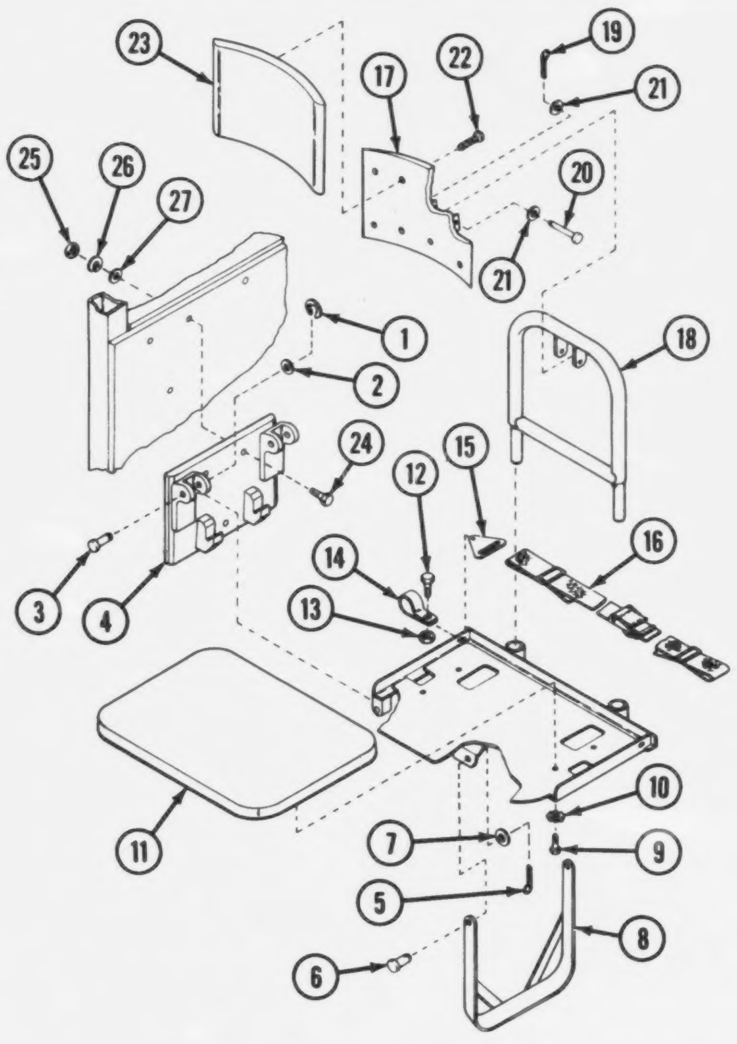


INSTALLATION

Position seat (2) on lefthand sponson (3) and install two quick-release pins (1).

TA57469

CREW SEATS (RIGHT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



SINGLE SEAT

REMOVAL

Remove two retaining rings (1), two flat washers (2), two grooved pins (3) and remove seat assembly from support (4). Discard retaining rings.

DISASSEMBLY

A Remove two cotter pins (5), two headed pins (6), two washers (7) and bracket (8). Discard cotter pins.

B Remove four screws (9), four lockwashers (10) and seat cushion (11). Discard lockwashers.

C Remove two screws (12), two self-locking nuts (13), two clamps (14), two plates (15) and safety belt assembly (16). Discard self-locking nuts.

D Remove backrest (17) from backrest frame (18) by removing cotter pin (19), headed pin (20) and two washers (21). Discard cotter pin.

E Remove eight screws (22) and cushion (23) from backrest (17).

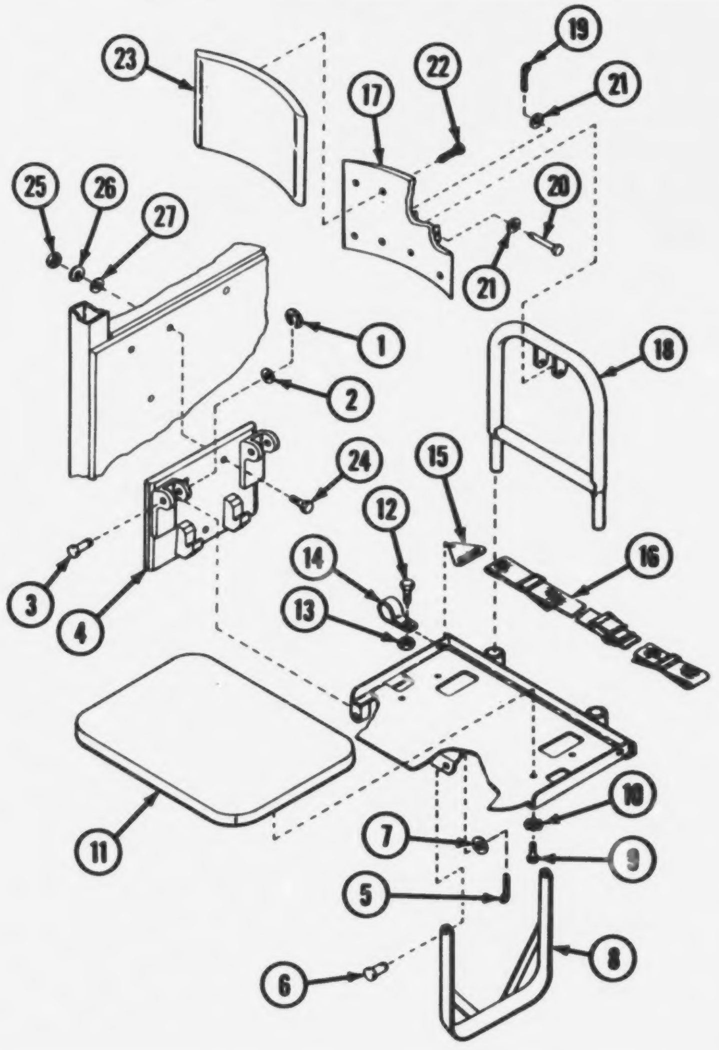
WARNING

Support (4) is heavy. Hold support while removing from canister compartment. Support could fall causing personnel injury.

F Remove support (4) from vehicle by removing three screws (24), three nuts (25), three lockwashers (26) and three flat washers (27). Discard lockwashers.

TA57256

CREW SEATS (RIGHT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

WARNING

Support (4) is heavy. Hold support while installing in canister compartment. Support could fall causing personnel injury.

A Install support (4) on canister rack with three screws (24), three flat washers (27), three new lockwashers (26) and three nuts (25).

B Install cushion (23) on backrest (17) with eight screws (22).

C Install backrest (17) on backrest frame (18) with headed pin (20), two washers (21) and new cotter pin (19).

D String ends of safety belt (16) through slotted ends of plates (15). Secure pointed ends of plates (15) to frame of seat assembly with two clamps (14), two screws (12) and two new self-locking nuts (13).

E Install seat cushion (11) with four screws (9) and four new lockwashers (10).

F Install bracket (8) against underside of seat assembly with two headed pins (6), two washers (7) and two new cotter pins (5).

INSTALLATION

Install seat assembly on support (4) with two grooved pins (3), two flat washers (2) and two new retaining rings (1).

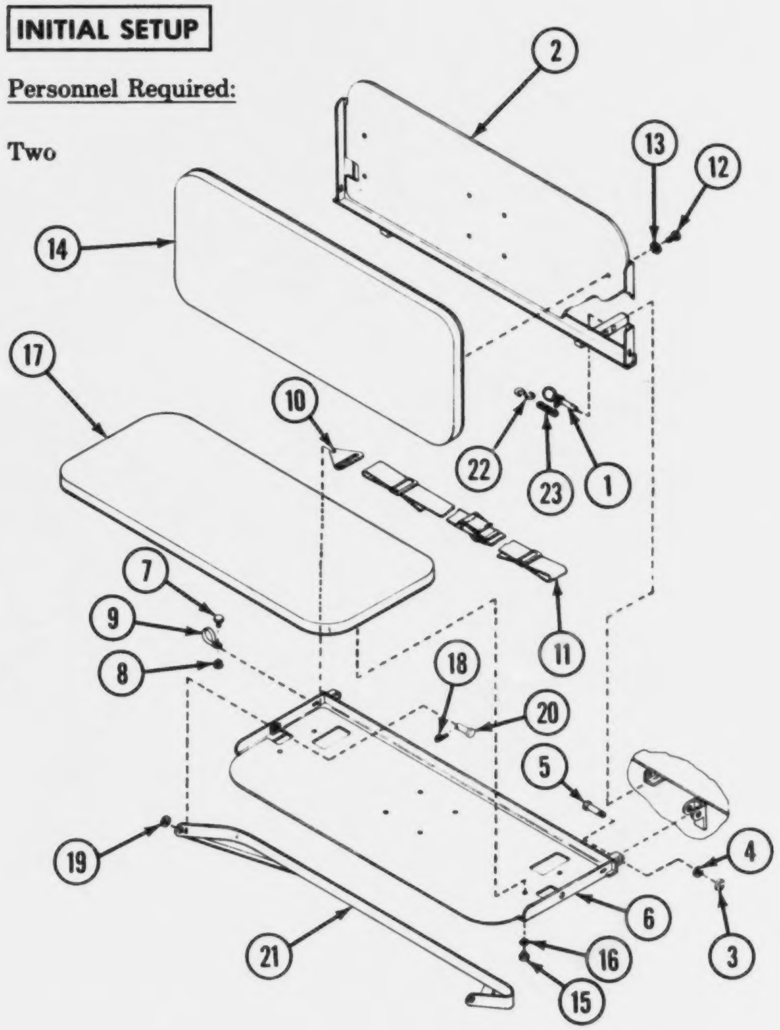
TA57257

CREW SEATS (LEFT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Personnel Required:

Two



WARNING

Seats are heavy. Support seats before pulling quick-release pins. Hinged seats, backrests and support brackets may swing down, causing personal injury.

DOUBLE SEAT

REMOVAL

A Remove two quick-release pins (1). Pull backrest (2) from rack assembly and remove from vehicle.

B Remove two retaining rings (3), two flat washers (4) and two pins (5) and remove seat (6) from vehicle. Discard retaining rings (3).

TA57258

CREW SEATS (LEFT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

DISASSEMBLY

A Remove two screws (7), two self-locking nuts (8), two clamps (9), two plates (10) and safety belt assembly (11). Discard self-locking nuts.

B Remove eight screws (12), eight lockwashers (13) and backrest cushion (14) from backrest (2). Discard lockwashers.

C Remove eight screws (15), eight lockwashers (16) and cushion (17). Discard lockwashers.

D Remove two cotter pins (18), two washers (19), two headed pins (20) and bracket (21). Discard cotter pins.

E Open two S-hooks (22) and remove two quick-release pins (1) and two chains (23).

ASSEMBLY

A Install two S-hooks (22) on cleat on underside of seat (6), with two chains (23) and two quick-release pins (1).

B Install bracket (21) on seat (6) with two headed pins (20), two washers (19) and two new cotter pins (18).

C Install cushion (17) on seat (6) with eight new lockwashers (16) and eight screws (15).

D Install backrest cushion (14) on backrest (2) with eight new lockwashers (13) and eight screws (12).

E String ends of safety belt (11) through slotted holes in two plates (10). Secure pointed ends of plates (10) to frame of seat (6) with two clamps (9), two screws (7) and two new self-locking nuts (8).

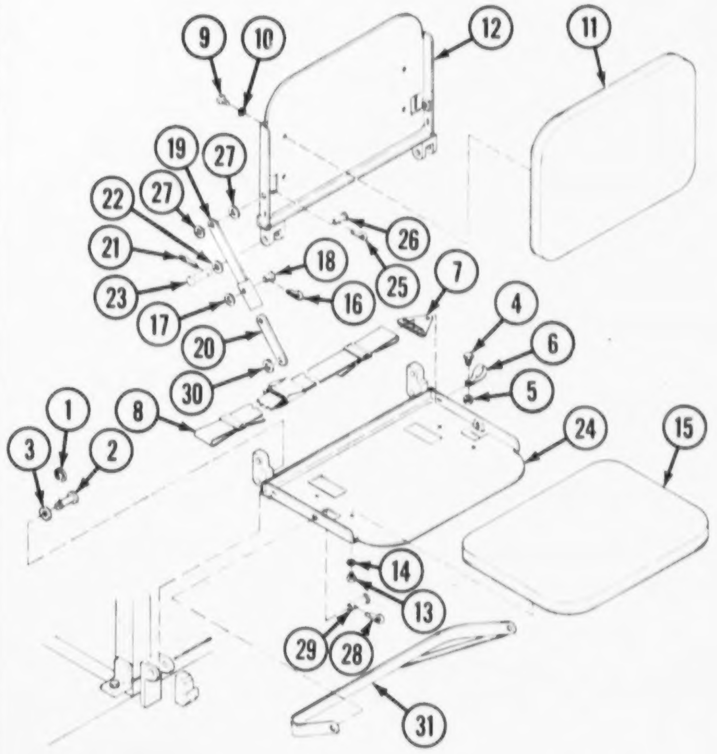
INSTALLATION

A Install seat (6) on mounts with two pins (5), two flat washers (4) and two new retaining rings (3).

B Install backrest (2) on mounts with two quick-release pins (1).

TA57259

CREW SEATS (LEFT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



SINGLE SEAT

REMOVAL

Remove two retaining rings (1), two headed pins (2) and two flat washers (3) and remove seat assembly from vehicle.

DISASSEMBLY

A Remove two screws (4), two self-locking nuts (5), two clamps (6), two plates (7) and safety belt assembly (8). Discard self-locking nuts.

B Remove four screws (9), four lockwashers (10) and backrest cushion (11) from backrest. Discard lockwashers.

C Remove four screws (13), four lockwashers (14) and cushion (15). Discard lockwashers.

D Remove two cotter pins (16), two flat washers (17), and two headed pins (18). Separate levers (19) from links (20). Discard cotter pins.

TA312913

CREW SEATS (LEFT SIDE): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

E Remove two cotter pins (21), two washers (22) and two headed pins (23), and separate backrest (12) from seat (24). Discard cotter pins.

NOTE

Tag left and right levers to ensure proper assembly.

F Remove two cotter pins (25), two headed pins (26) and four washers (27), and remove levers (19) from backrest (12). Discard cotter pins.

G Remove two cotter pins (28), two headed pins (29) and two washers (30), and remove links (20) and bracket (31) from seat (24). Discard cotter pins.

ASSEMBLY

A Install bracket (31) and links (20) on seat (24) with two headed pins (29), two washers (30) and two new cotter pins (28).

B Install left and right levers (19) on backrest (12) with two headed pins (26), four washers (27) and two new cotter pins (25).

C Install backrest (12) on seat (24) with two headed pins (23), two washers (22) and two new cotter pins (21).

D Install links (20) on levers (19) with two headed pins (18), two flat washers (17) and two new cotter pins (16).

E Install seat cushion (15) on seat (24) with four new lockwashers (14) and four screws (13).

F Install cushion (11) on backrest (12) with four new lockwashers (10) and four screws (9).

G String ends of safety belt (8) through slotted ends of two plates (7). Secure pointed ends of plates (7) to seat (24) with two clamps (6), two screws (4) and two new self-locking nuts (5).

INSTALLATION

Install seat assembly in mounting brackets on canister racks with two headed pins (2). Secure with two flat washers (3) and two retaining rings (1).

TA312914

Section II HATCHES, LATCHES, LOCKS AND COVERS

DRIVER'S HATCH COVER AND COMPONENTS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

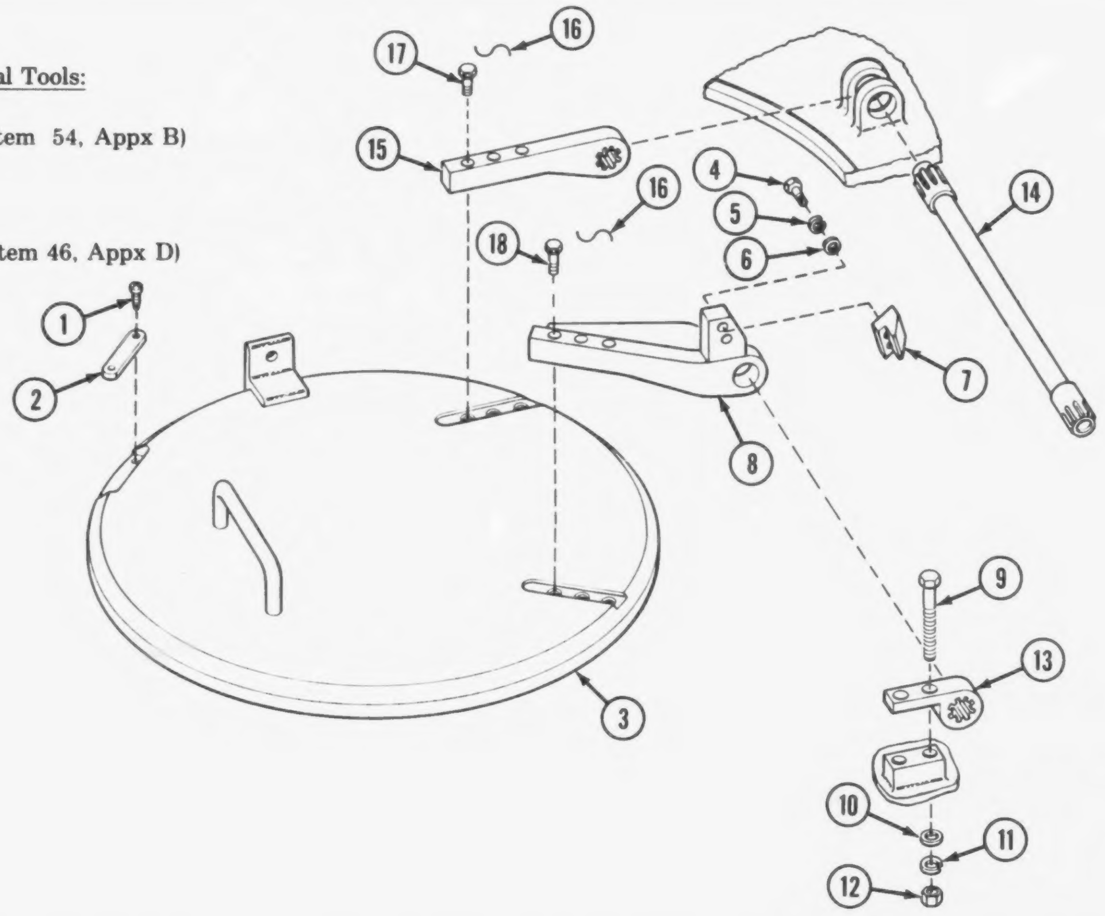
Pliers, wire twisting (item 54, Appx B)

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two



TA312915

DRIVER'S HATCH COVER AND COMPONENTS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

A Remove two screws (1) and remove wear plate (2) from driver's hatch cover (3).

B Remove two screws (4), two lockwashers (5), two flat washers (6) and strike (7) from outer hatch cover arm (8). Discard lockwashers.

C Raise driver's hatch cover (3) to a neutral position (approximately 90 degrees), and have assistant hold.

D Remove two screws (9), two flat washers (10), two lockwashers (11) and two nuts (12), holding torsion bar anchor (13) to vehicle. Discard lockwashers.

E Tap anchor (13) free from torsion bar hinge (14).

F Tap torsion bar hinge (14) free from hatch cover arms (8 and 15) and vehicle-mounted brackets.

G Remove hatch cover (3) and attached arms (8 and 15) from vehicle.

DISASSEMBLY

A Remove and discard lockwire (16) from screws (17 and 18).

B Remove three screws (17) holding inner arm (15) and three screws (18) securing outer arm (8) to hatch cover (3).

NOTE

For removal of pad and seal from cover, see page 9-22.

ASSEMBLY

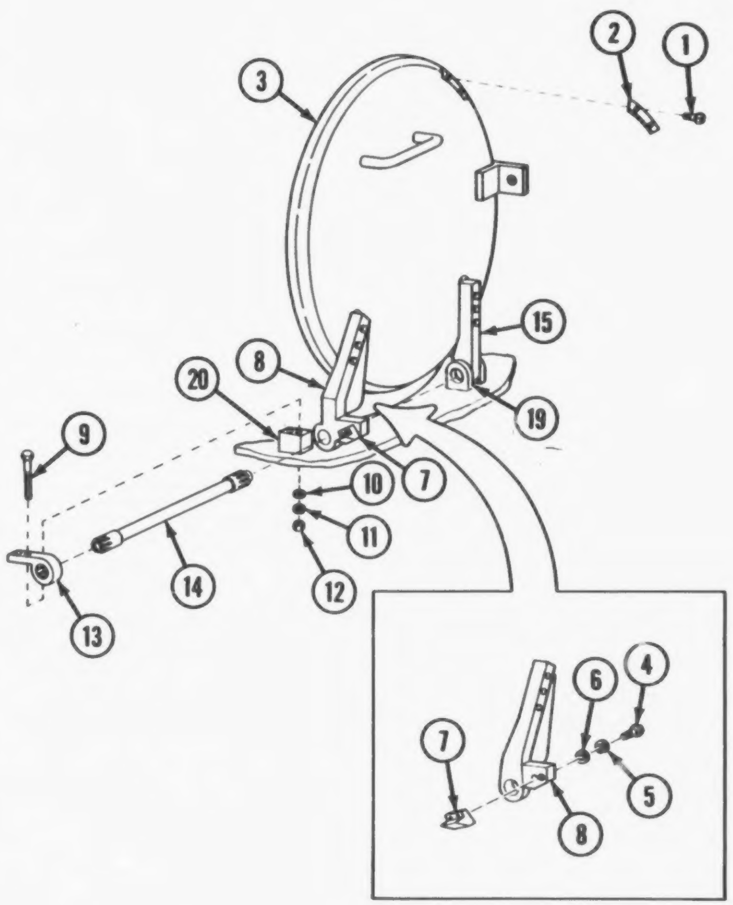
A Apply zinc chromate paste (item 46, Appx D) to mating surfaces of hatch cover (3) and arms (8 and 15).

B Install arm (8) on hatch cover (3) with three screws (18). Secure screws (18) with new lockwire (16).

C Install arm (15) on hatch cover (3) with three screws (17). Secure screws (17) with wire new lockwire (16).

TA312916

DRIVER'S HATCH COVER AND COMPONENTS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Coat both mating surfaces of wear plate (2), strike (7) and torsion bar anchor (13) with zinc chromate paste (item 46, Appx D).

B Install assembled hatch cover (3) on hull. Have assistant hold cover (3) in vertical position. Make sure hatch cover arm (15) engages hull mounting bracket (19).

C Insert torsion bar hinge (14) through hatch cover arm (8). Aline splined end of torsion bar hinge (14) with splined hinge hole in hatch cover arm (15). Tap torsion bar hinge (14) into arm (15).

D Aline anchor (13) with splined outer end of torsion bar hinge (14). Keep anchor mounting surface parallel to its mounting block surface (20). Tap anchor (13) onto torsion bar hinge (14).

E Secure anchor (13) to hull-mounted block (20) with two screws (9), two flat washers (10), two new lockwashers (11) and two nuts (12).

F Install strike (7) on hatch cover arm (8) with two screws (4), two new lockwashers (5) and two flat washers (6).

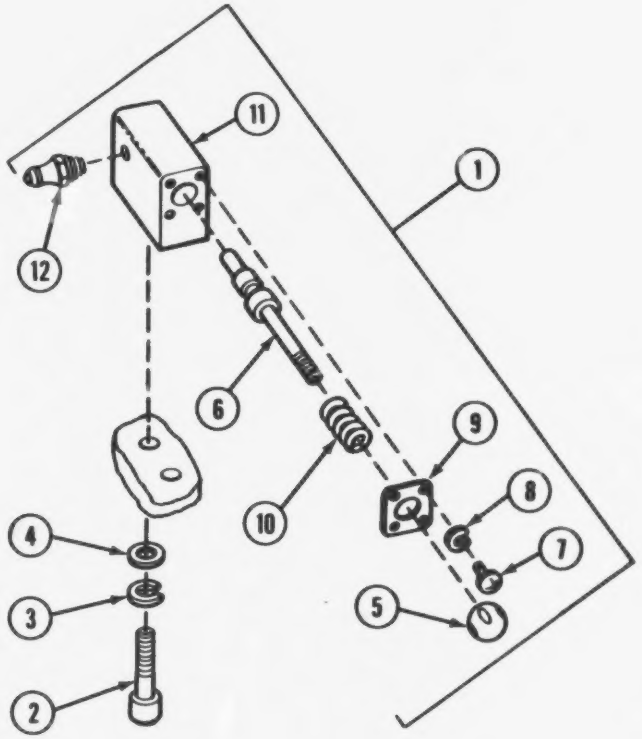
NOTE

Hatch should have enough spring to remain open approximately 25-35 degrees. Torsion bar is installed to assist in opening hatch.

G Install wear plate (2) on hatch cover (3) with two screws (1).

TA312917

DRIVER'S HATCH COVER LATCH: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

Remove latch (1) by removing two screws (2), two lockwashers (3) and two flat washers (4).

DISASSEMBLY

A Unscrew knob (5) from pin (6).

B Remove four screws (7) and four lockwashers (8) to release cover (9), spring (10) and pin (6) from latch body (11).

C Remove fitting (12) from latch body (11).

ASSEMBLY

A Reverse disassembly procedures. Apply sealing compound (item 27, Appx D) to all threads prior to assembly.

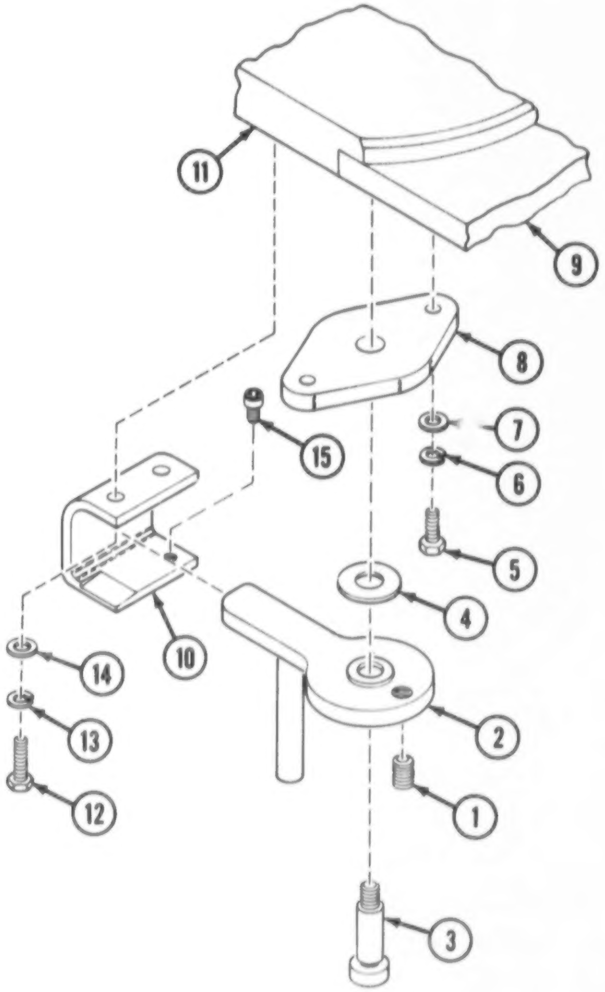
B Pack latch assembly (1) with grease (item 7, Appx D).

INSTALLATION

Reverse removal procedure.

TA310006

DRIVER'S HATCH SECURITY LATCH: REMOVAL AND INSTALLATION



REMOVAL

A Unscrew ball plunger (1) and remove from latch assembly (2).

B Remove screw (3). Remove latch assembly (2) and thrust bearing (4).

C Remove two screws (5), two lockwashers (6) and two flat washers (7), and remove mounting plate (8) from inside hull (9). Discard lockwashers.

D Remove latch hook (10) from hatch cover (11) by removing two screws (12), two lockwashers (13) and two flat washers (14). Discard lockwashers.

E Remove stop screw (15) from latch hook (10).

INSTALLATION

A Install stop screw (15) in latch hook (10).

B Install latch hook (10) on bottom of hatch cover (11) with two screws (12), two new lockwashers (13) and two flat washers (14).

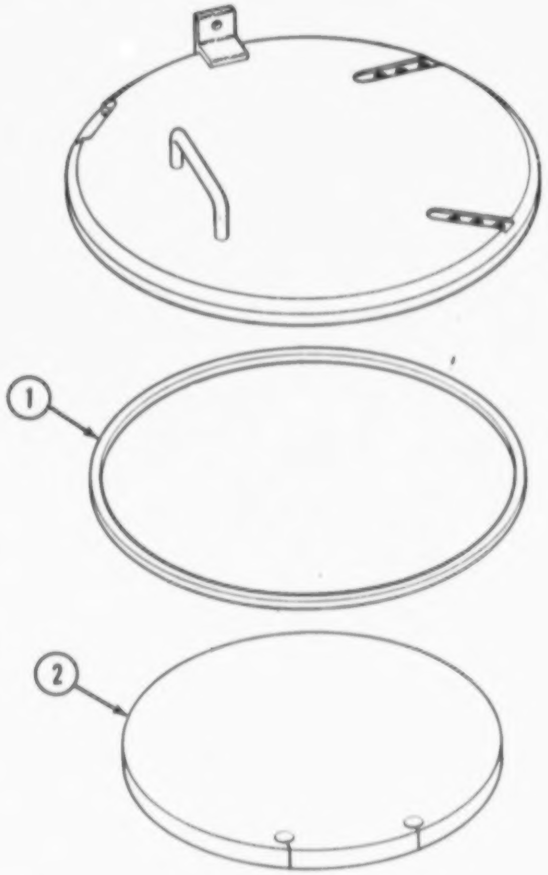
C Install mounting plate (8) on inside of hull (9) with indents facing down and secure with two screws (5), two new lockwashers (6) and two flat washers (7).

D Install latch assembly (2) and thrust bearing (4) on mounting plate (8) with screw (3).

E Adjust ball plunger (1) to latch assembly (2). Peen ball plunger threads.

TA312918

DRIVER'S HATCH COVER SEAL AND PAD: REMOVAL AND INSTALLATION



REMOVAL

A Remove seal (1) and discard.

B Remove pad (2) and discard.

C Use solvent (item 19, Appx D) and clean rags (item 50, Appx D) to thoroughly clean and dry seal channel and underside of cover surface. Be sure to remove all particles.

INSTALLATION

A Apply thin coating of adhesive (item 4, Appx D) to bottom of hatch cover seal channel, and to mounting surface of seal (1). Allow adhesive to dry until tacky.

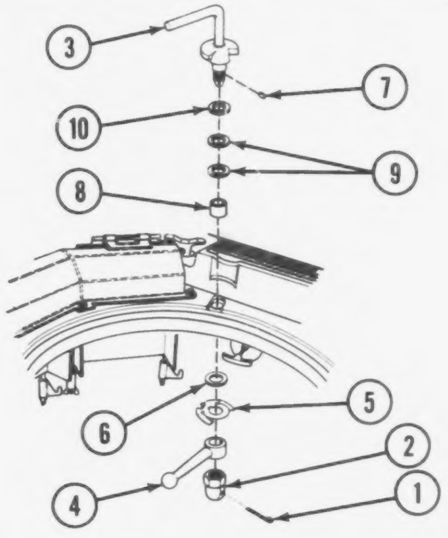
B Install seal (1) in seal channel of hatch cover. Avoid stretching or bunching of seal.

C Apply thin coating of adhesive (item 4, Appx D) to bottom of hatch cover, and to mounting surface of pad (2). Allow adhesive to dry until tacky.

D Install pad (2) on hatch cover.

TA310008

DRIVER'S HATCH COVER CAM LOCK: REMOVAL AND INSTALLATION



REMOVAL

A Remove cotter pin (1) from nut (2).

B Remove nut (2) from cam lock (3).

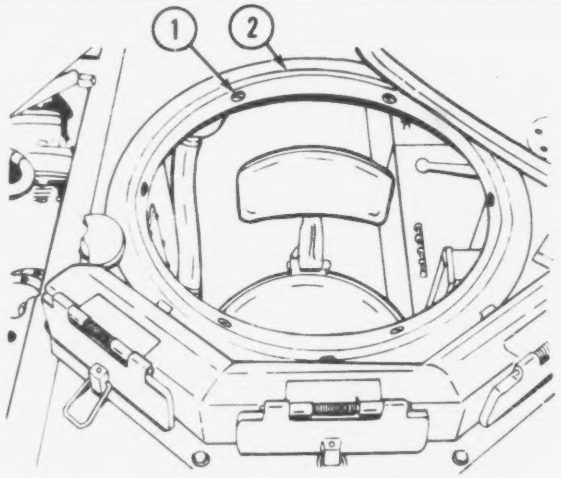
C Remove lever (4), spring (5), washer (6) and key (7) from inside hull.

D Remove bearing (8), washers (9), spring washer (10) and cam lock (3) from outside hull.

INSTALLATION

Reverse removal procedures.

DRIVER'S HATCH SEAL: REMOVAL AND INSTALLATION



REMOVAL

A Remove six screws (1).

B Remove hatch seal (2). Use solvent (item 19, Appx D) and thoroughly clean and dry area where seal is removed around hatchway.

INSTALLATION

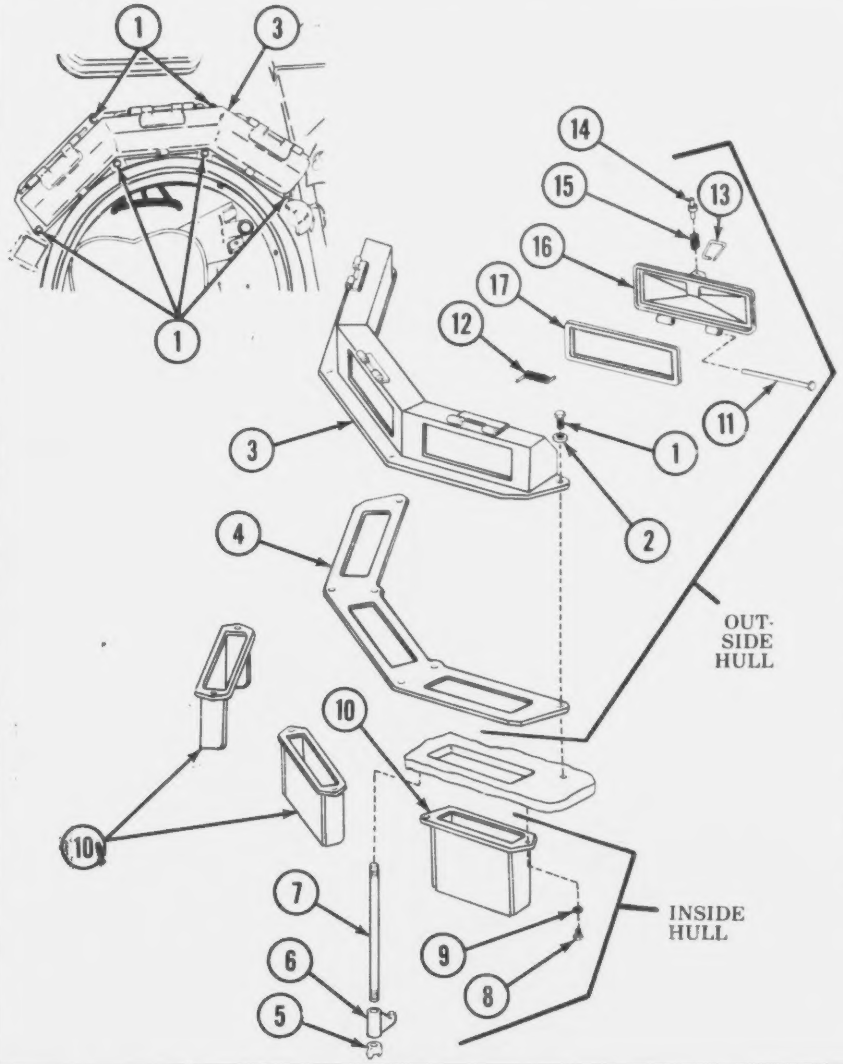
A Apply thin coating of adhesive (item 4, Appx D) around hatchway seal mounting area, and to mounting surface of seal (2). Allow adhesive to dry until tacky.

B Install seal (2).

C Install six screws (1).

TA310009

PERISCOPE M45 COVER, DOORS AND SLEEVE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove six screws (1), six lockwashers (2), cover (3) and remove and discard seal (4) from outside hull.

B Remove six wing nuts (5), six supports (6) and six rods (7) from inside hull.

C Remove six screws (8), six lockwashers (9) and three periscope sleeves (10) from inside hull.

DISASSEMBLY

A Remove three pins (11) and three springs (12).

B Remove three rings (13), three pins (14) and three springs (15).

C Remove three doors (16) and three seals (17). Discard seals (17).

ASSEMBLY

A Replace three seals (17).

B Reverse disassembly procedures.

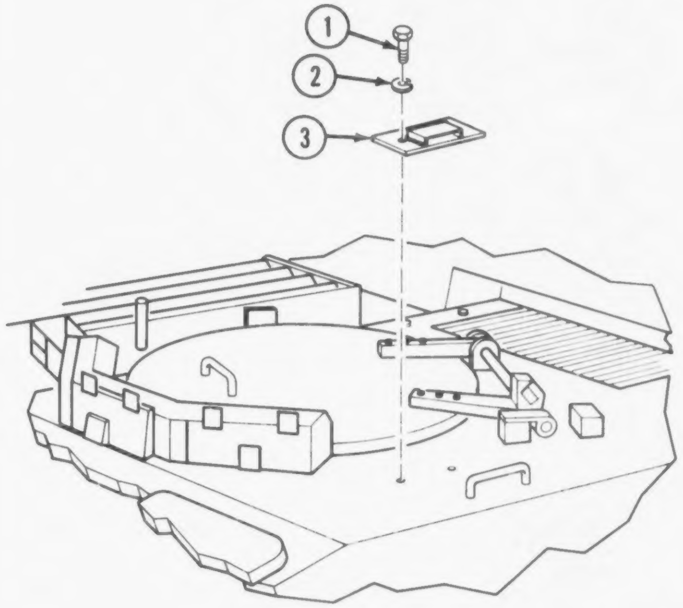
INSTALLATION

A Replace seal (4).

B Reverse removal procedures.

TA310010

DRIVER'S PORTABLE INSTRUMENT PANEL MOUNTING BRACKET: REMOVAL AND INSTALLATION



REMOVAL

Remove two screws (1) and two lockwashers (2) securing bracket (3) to vehicle. Discard lockwashers.

INSTALLATION

Install bracket (3) to vehicle with two new lockwashers (2) and two screws (1).

TA312919

COMMANDER'S CUPOLA PERISCOPE: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

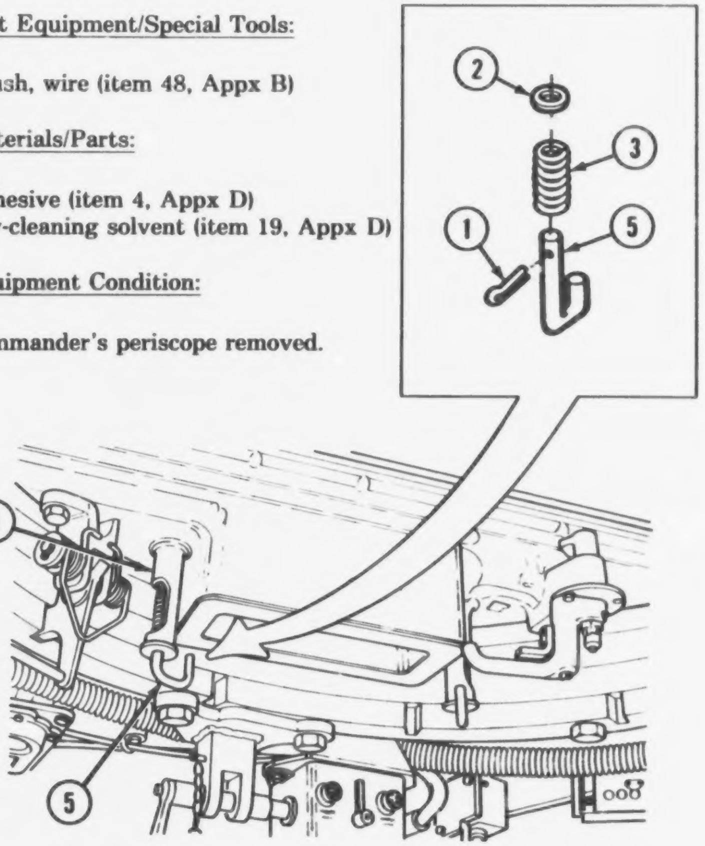
Brush, wire (item 48, Appx B)

Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)

Equipment Condition:

Commander's periscope removed.



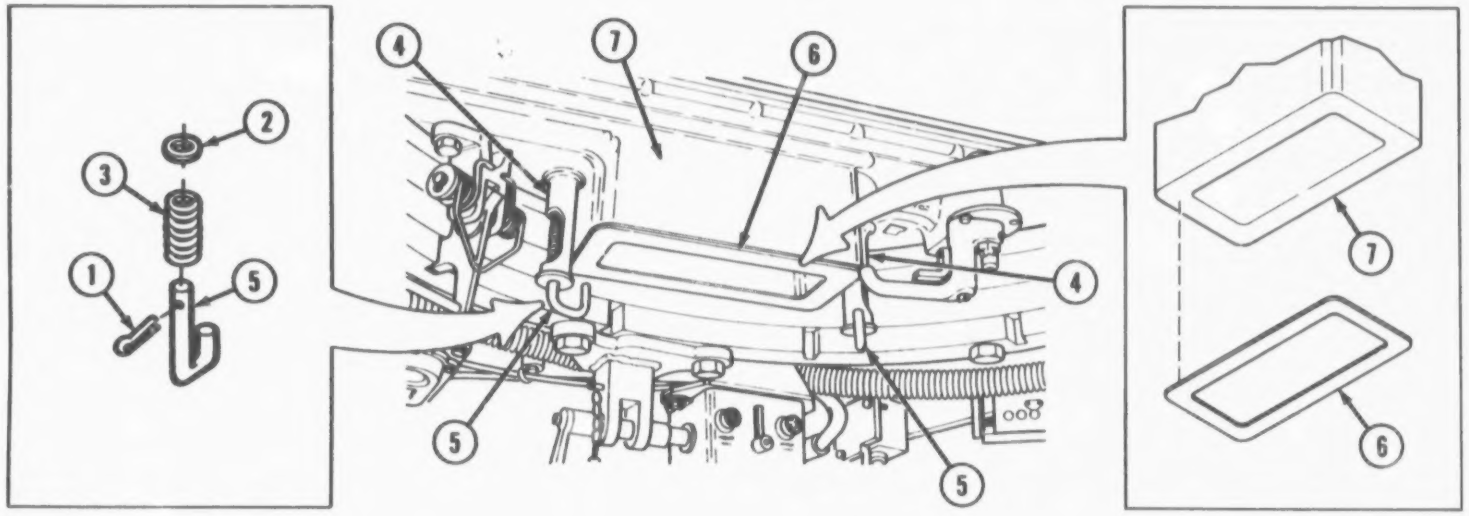
REMOVAL

A Remove and discard two cotter pins (1), releasing two flat washers (2) and two springs (3) from sides of housings (4) and two periscope hooks (5) from bottoms of housings (4).

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

TA312920



B Remove and discard seal (6). Clean dirt and adhesive from gasket seat. Use dry-cleaning solvent (item 19, Appx D) and wire brush (item 48, Appx B) if necessary.

INSTALLATION

A Apply thin coating of adhesive (item 4, Appx D) to mounting surface of new seal (6) and cupola body (7). Allow to dry 5 minutes until tacky. Press seal (6) in place. Allow to cure for 30 minutes.

B Remove excess adhesive from face of seal (6). Use dry-cleaning solvent (item 19, Appx D), if necessary.

C Insert two springs (3) and two flat washers (2) into housings (4) from side.

D Insert two periscope hooks (5) up into housings (4) from bottom through springs (3) and flat washers (2).

E Compress flat washers (2) and springs (3) onto hooks (5), and secure with two new cotter pins (1).

TA312921

COMMANDER'S CUPOLA HATCH DOOR: DISASSEMBLY AND ASSEMBLY

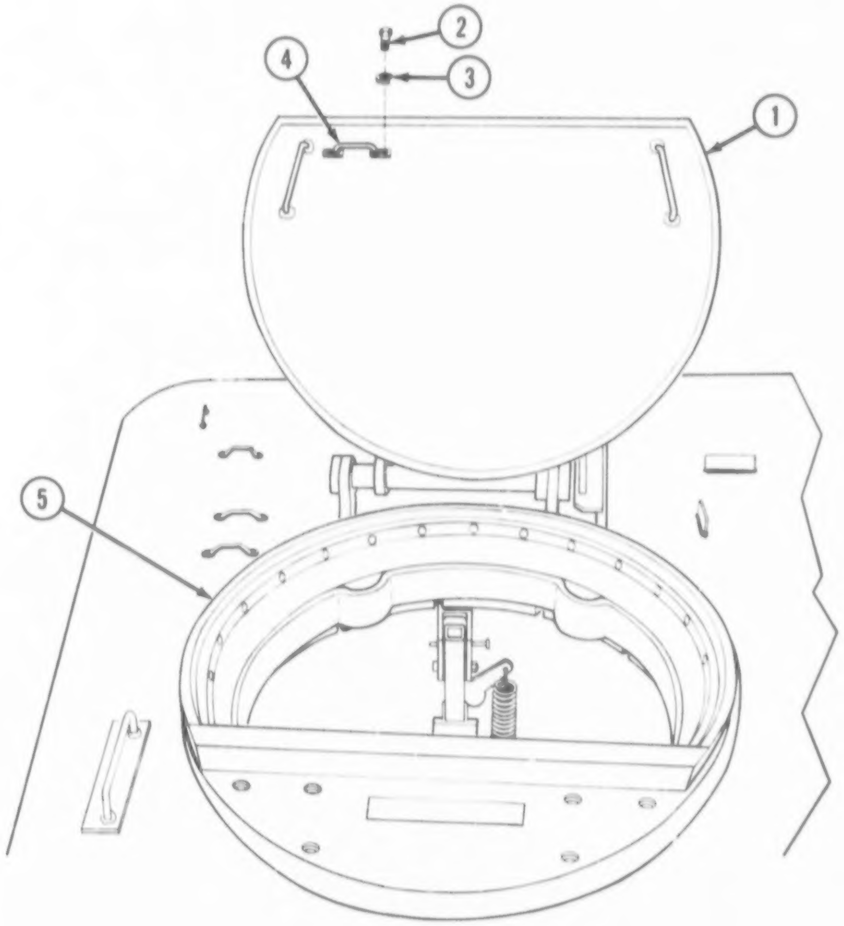
INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)



TA312922

COMMANDER'S CUPOLA HATCH DOOR: DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

A Open and secure commander's hatch door (1).

B Remove two screws (2) and two lockwashers (3). Discard lockwashers.

C Remove locking cam seat (4).

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

D Scrape defective seal (5) from seal channel in door frame. Use wire brush (item 48, Appx B) and dry-cleaning solvent (item 19, Appx D), if necessary. Discard seal.

ASSEMBLY

A Apply thin coating of adhesive (item 4, Appx D) to seal channel in door frame, and to mating surfaces of new seal (5). Allow to dry 5 minutes until tacky.

NOTE

It is difficult to reposition seal once contact is made with seal channel. Avoid stretching or bunching seal.

B Press seal (5) firmly into seal channel. Clean any excess adhesive from face of seal. Use dry-cleaning solvent (item 19, Appx D) if necessary. Allow adhesive to cure for 30 minutes.

C Install locking cam seat (4) on underside of hatch door (1) using two new lockwashers (3) and two screws (2).

D Close and secure commander's hatch door (1).

TA312923

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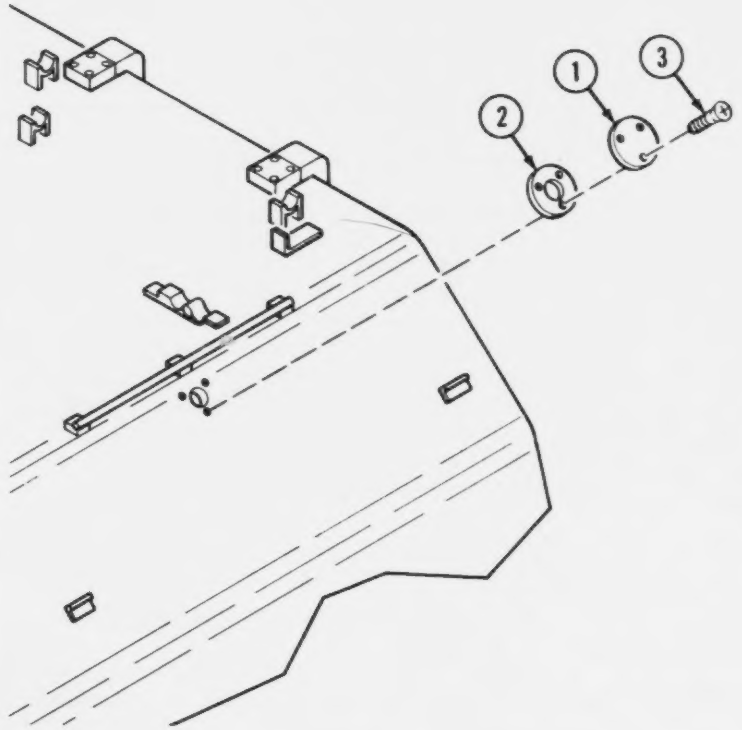
ANTENNA MOUNTING COVER PLATE: REMOVAL AND INSTALLATION



REMOVAL

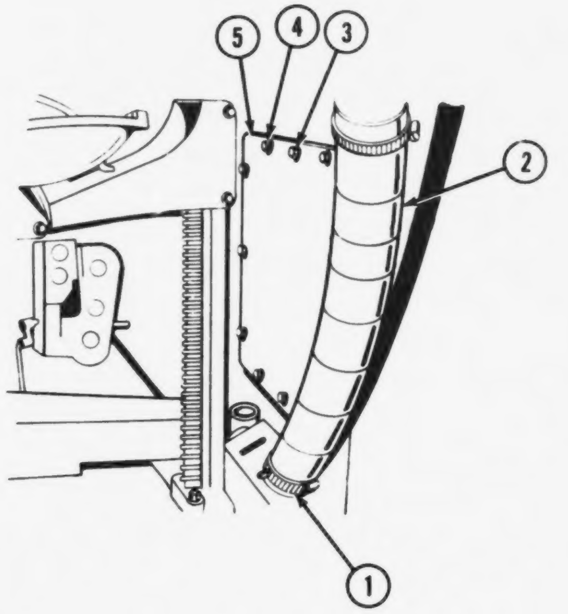
Remove plate (1) and gasket (2) by removing three screws (3). Discard gasket.

INSTALLATION

Install plate (1) and new gasket (2) with three screws (3).

TA312924

ENGINE COMPARTMENT ACCESS COVER: REMOVAL AND INSTALLATION



REMOVAL

A Loosen clamp (1) and disconnect hose (2).

B Remove 12 screws (3), 12 lockwashers (4), access cover (5) and gasket (6).

INSTALLATION

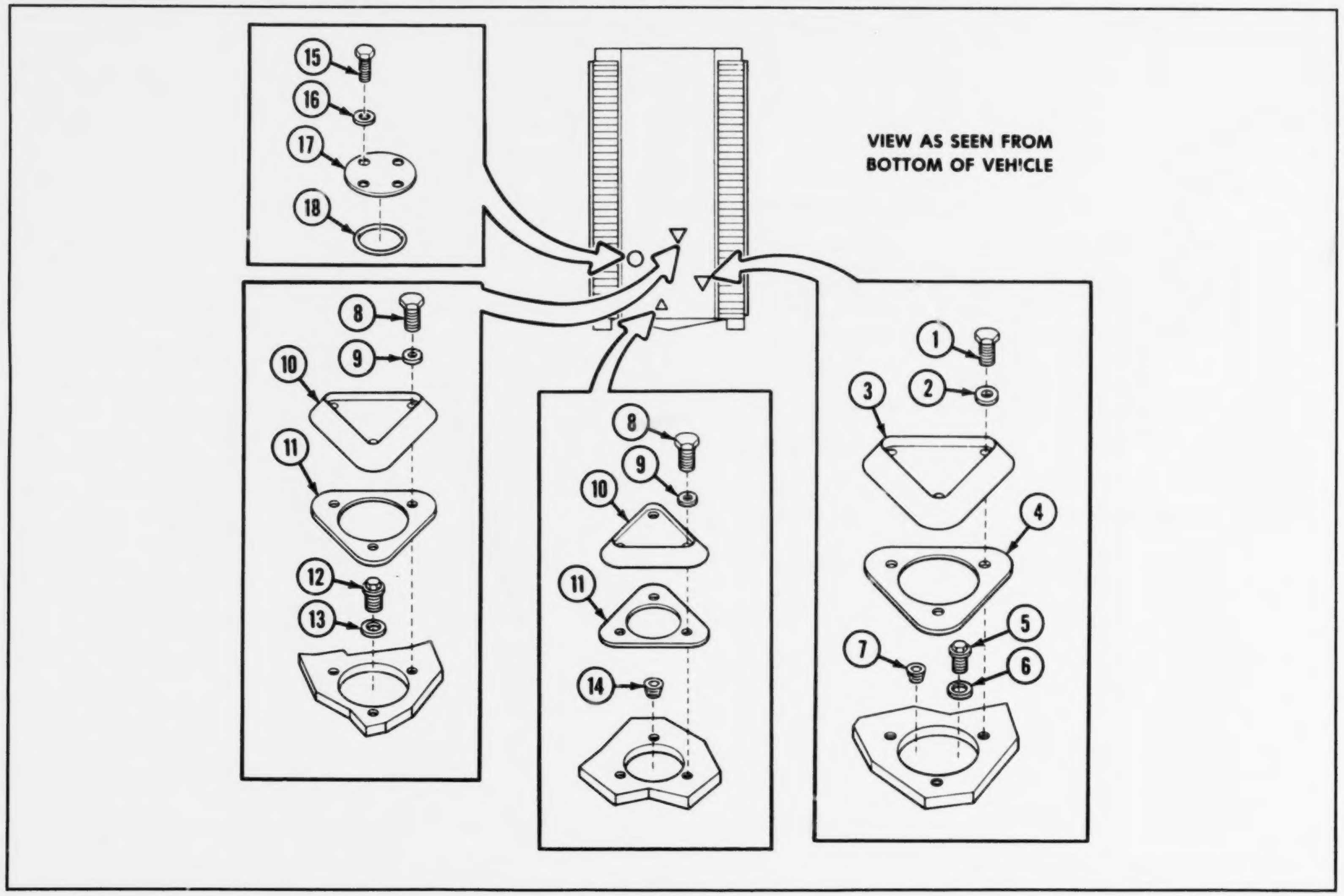
WARNING

When installing engine compartment access cover, make sure that all screws are secured. Carbon monoxide poisoning could result if cover is loose.

Reverse removal procedures.

TA310011

DRAIN PLUGS AND COVERS: REMOVAL AND INSTALLATION


VIEW AS SEEN FROM
BOTTOM OF VEHICLE
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TA312925

DRAIN PLUGS AND COVERS: REMOVAL AND INSTALLATION

REMOVAL

WARNING

When engine is hot, use caution when removing engine coolant drain plug, engine oil drain plug and transmission oil drain plug.

NOTE

Provide adequate containers to catch fluids upon removal of drain plugs.

A Remove three screws (1), three washers (2), large cover (3) and gasket (4). Discard gasket.

B Remove engine coolant drain plug (5) and gasket (6). Discard gasket.

C Remove fuel drain plug (7).

D Remove six screws (8), six washers (9), two small covers (10) and two gaskets (11). Discard gaskets.

E Remove transmission oil drain plug (12) and gasket (13). Discard gasket.

F Remove engine oil drain plug (14).

G Remove four screws (15) and four flat washers (16) releasing hull floor drain access cover (17) and preformed packing (18). Discard packing.

INSTALLATION

A Install new packing (18) and hull floor drain access cover (17) on floor of hull directly below steering wheel with four screws (15) and four flat washers (16).

B Install engine oil drain plug (14), transmission oil drain plug (12) and new gasket (13), engine coolant drain plug (5) and new gasket (6), and fuel drain plug (7).

C Install new new gaskets (11) and two covers (10) with six screws (8) and six washers (9).

D Install new gasket (4) and cover (3) with three screws (1) and three washers (2).

TA312926

CREW COMPARTMENT DRAIN AND EXPANSION PLUGS: REMOVAL AND INSTALLATION

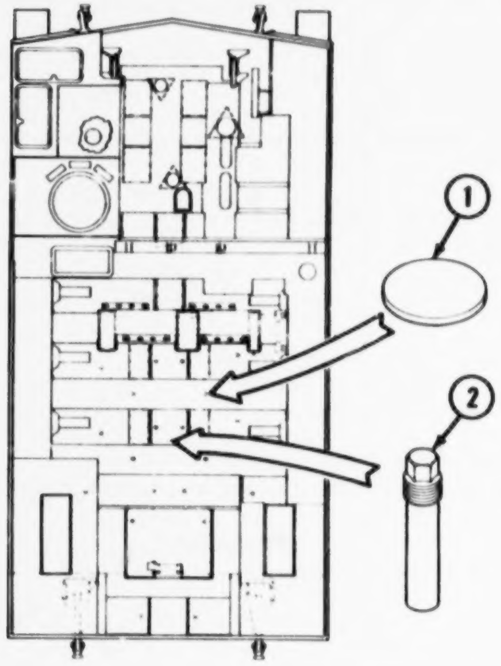
INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Dry-cleaning solvent (item 19, Appx D).



REMOVAL

NOTE

Removal of any expansion plug will render it unusable. Remove plug only if necessary.

A Remove any one of 24 expansion plugs (1) by cutting with a chisel.

B Unscrew drain plug (2) and remove from vehicle floor.

INSTALLATION

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

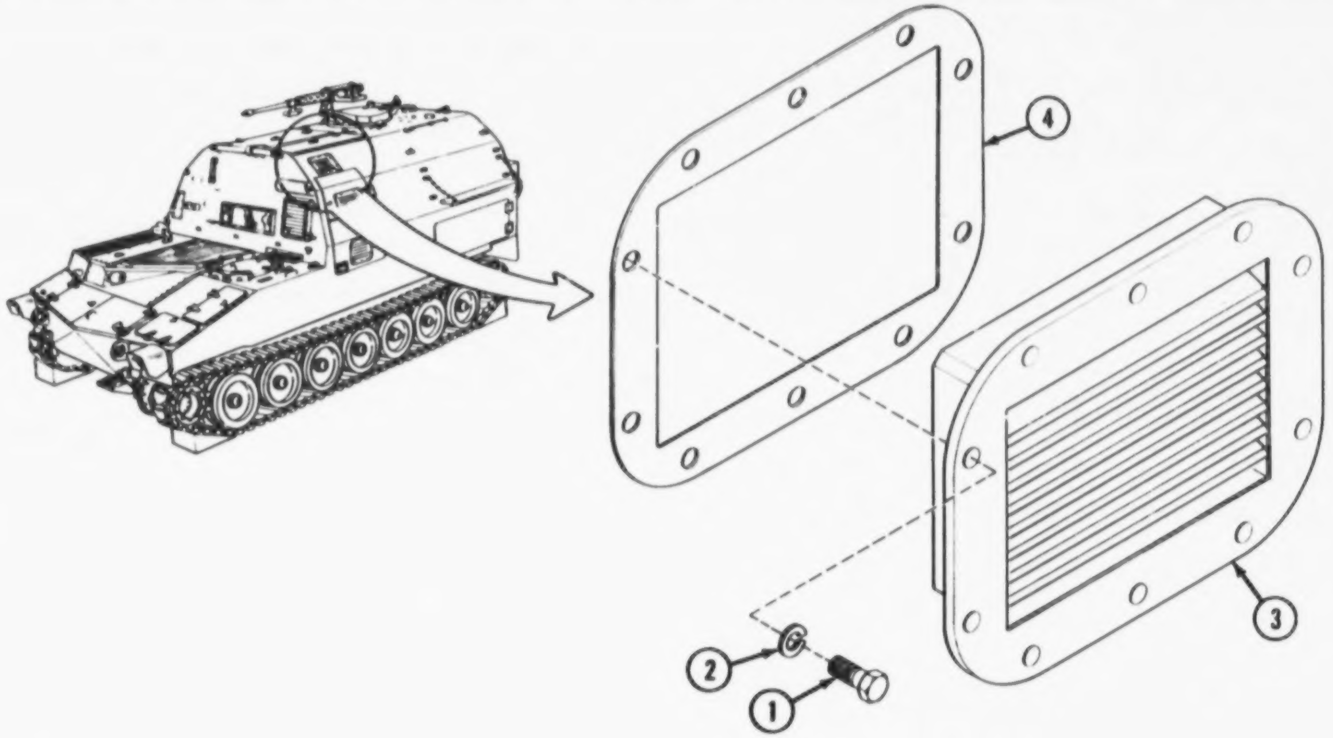
A Clean holes for plugs with dry-cleaning solvent (item 19, Appx D) and a suitable wire brush (item 48, Appx B).

B Screw drain plug (2) into mounting hole in floor.

C Insert new expansion plug (1) into groove in mounting hole. Tap with hammer to seat assembly.

TA312927

APU COMPARTMENT LOUVERED GRILLE: REMOVAL AND INSTALLATION



REMOVAL

A Remove 10 screws (1) and 10 lockwashers (2). Discard lockwashers.

B Remove APU louvered grille (3) and gasket (4) from side of vehicle.

INSTALLATION

Install gasket (4) and grille (3) with 10 screws (1) and 10 new lockwashers (2).

TA312928

PERSONNEL AIR VENTILATOR DOOR AND GRILLE: REMOVAL, REPAIR AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 20, Appx D)

REMOVAL

A Remove five hex head screws (1) and one hex socket screw (2) from grille (3) located behind driver's hatch.

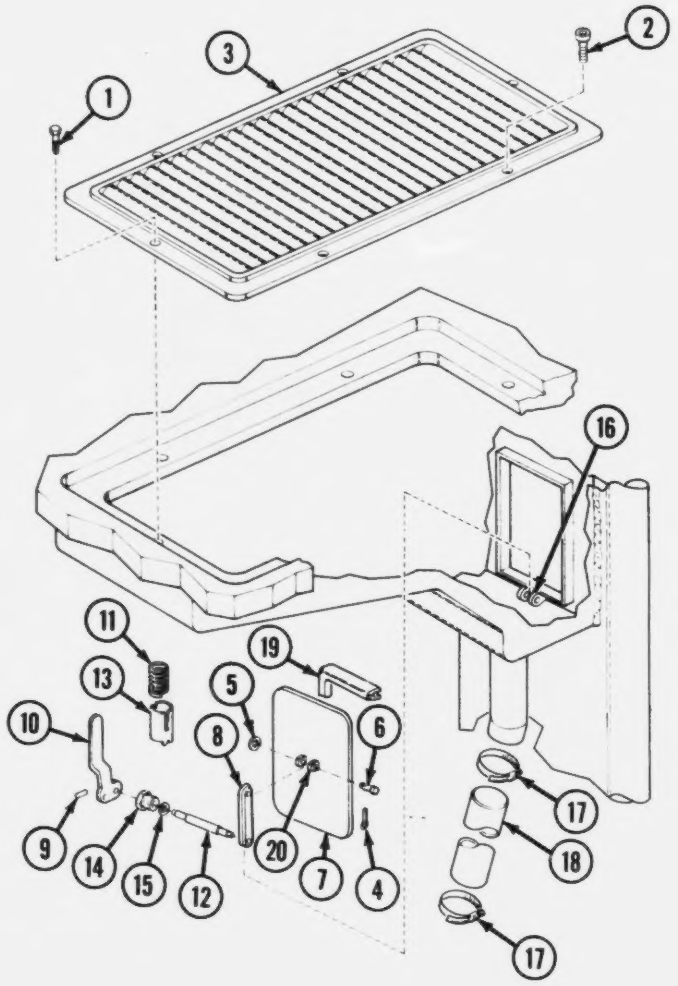
B Remove cotter pin (4) and flat washer (5). Discard cotter pin.

C Pull headed pin (6) releasing door (7) from link (8).

NOTE

Handle assembly is spring-loaded; use care when removing spring pin.

D Drive spring pin (9) from handle assembly (10). Discard spring pin.



TA312929

PERSONNEL AIR VENTILATOR DOOR AND GRILLE: REMOVAL, REPAIR AND INSTALLATION

E Turn handle assembly (10) to relieve tension on spring (11). Pull handle assembly (10) from hinge pin (12), releasing spring (11) and spring retainer (13).

F Unscrew and remove packing nut (14).

G Remove and discard packing (15) from packing nut (14).

H Pull hinge pin (12) releasing link (8) from hinge lugs (16), part of hull.

I Loosen two clamps (17). Flex and remove hose (18).

REPAIR

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

A If door seal (19) is defective, scrape it off with putty knife, clean contact areas with dry-cleaning solvent (item 20, Appx D) and wire brush (item 48, Appx B)

B Install new seal with thin coating of rubber adhesive (item 4, Appx D) in areas of contact with hull.

C If square hole in link (8) or square section of hinge pin (12) is deformed, replace link and/or pin.

D If spring (11) is less than 3 inches long, replace it.

INSTALLATION

A Flex and install hose (18) with two clamps (17).

B Install link (8) between hinge lugs (16) with hinge pin (12).

C Install new packing (15) in packing nut (14). Install packing nut (14) on hinge pin (12).

D Install spring (11) in spring retainer (13).

E Position handle assembly (10) so pins engage slots in spring retainer (13).

F Turn hinge pin (12) to aline hole with mounting hole in handle assembly (10). Install new spring pin (9).

G Position door (7) so round hole in link (8) alines with holes in hinge lugs (20) on door. Install headed pin (6) from rear side.

H Secure with flat washer (5) and new cotter pin (4).

I Secure grille (3) to position behind driver's hatch with one hex socket screw (2) and five hex head screws (1).

TA312930

AFES FIRE EXTINGUISHER BOX ASSEMBLY (VEHICLES 345 AND ABOVE): REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Dry-cleaning solvent (item 20, Appx D)
Adhesive (item 3, Appx D)
Adhesive sealant (item 5, Appx D)

Test Equipment/Special Tools:

Sling, endless, 4 ft. (item 80, Appx B)
Shackle (item 81, Appx B)
Suitable lifting device

Personnel Required:

Two

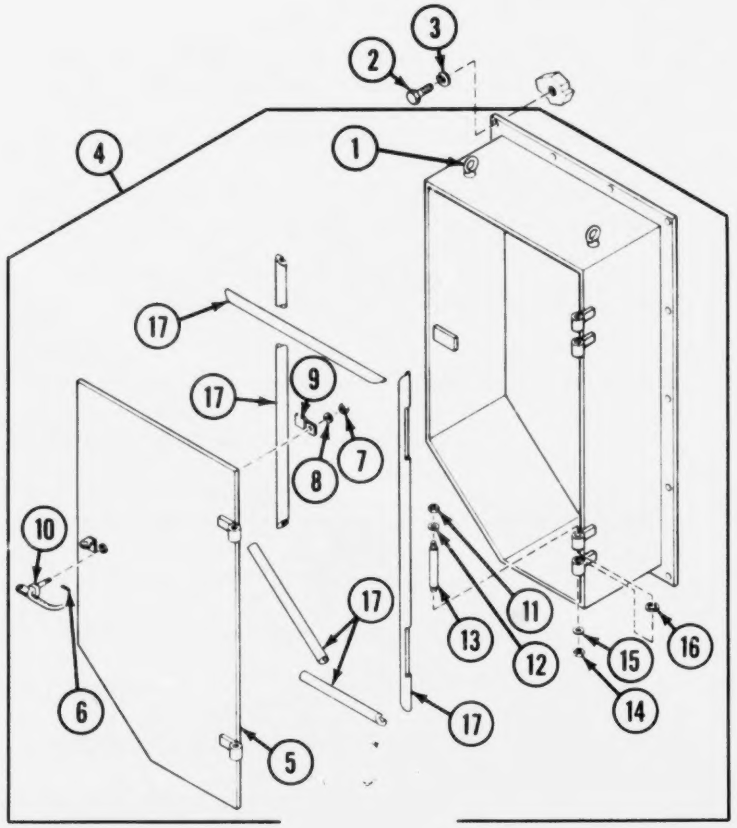
REMOVAL

CAUTION

Fire extinguisher valve and bottle assemblies are sensitive to damage. Use care when removing box assembly from hull. Failure to comply may cause equipment damage.

A Attach sling (item 80, Appx B), using shackles (item 81, Appx B), to lifting eyes (1).

B Attach suitable lifting device to sling.



TA57459

AFES FIRE EXTINGUISHER BOX ASSEMBLY (VEHICLES 345 AND ABOVE): REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)

WARNING

Box assembly is heavy. Ensure box assembly is supported when screws are removed. Failure to comply may cause personnel injury.

C Remove 13 screws (2), 13 lockwashers (3) and box assembly (4). Discard lockwashers.

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

D Clean mounting surfaces with dry-cleaning solvent (item 20, Appx D).

DISASSEMBLY

A Open fire extinguisher box door (5).

B Remove cotter pin (6), nut (7), flat washer (8), and latch plate (9). Discard cotter pin.

C Remove door handle (10).

NOTE

Both hinge pins are removed following same procedure.

D Remove locknut (11) and washer (12). Discard locknut.

WARNING

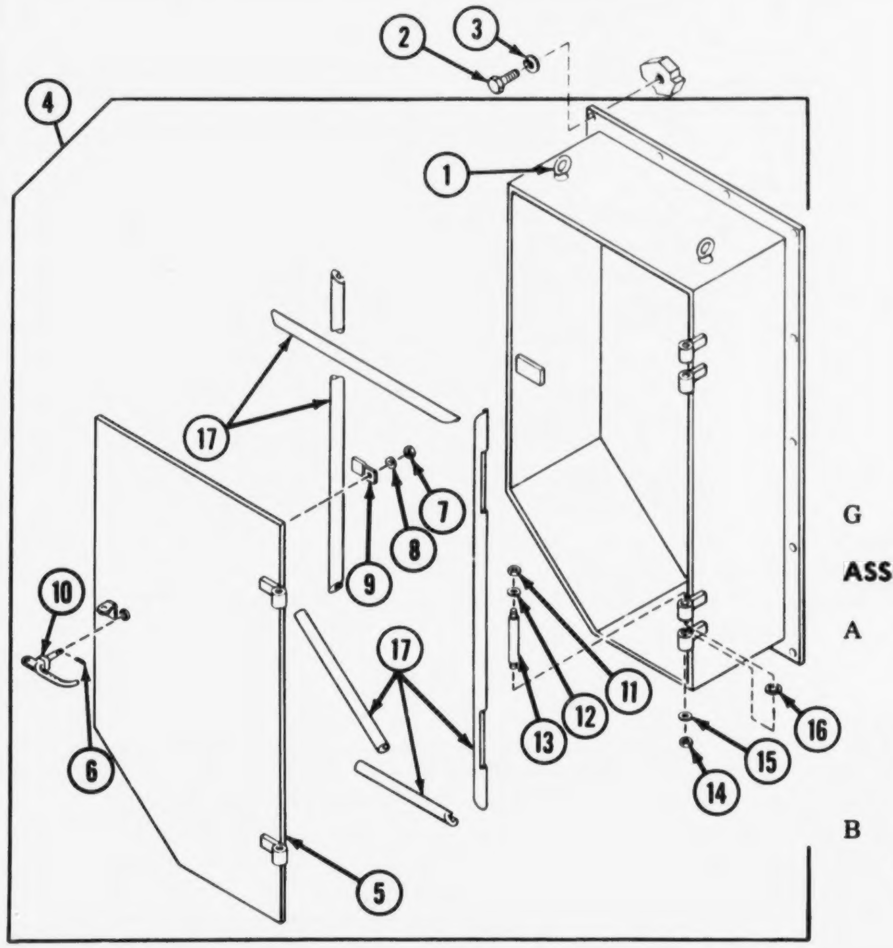
Door is very heavy. Ensure door is supported when pins are removed. Failure to comply may result in injury.

E Support door assembly (5) and remove hinge pin (13) with locknut (14) and washer (15) attached. Remove washer (16) from mounting surfaces. Tap hinge pins lightly to prevent damage to threads.

F Remove door assembly (5).

TA57460

AFES FIRE EXTINGUISHER BOX ASSEMBLY (VEHICLES 345 AND ABOVE): REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)



WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

G Use dry-cleaning solvent (item 20, Appx D) to remove seals (17).

ASSEMBLY

A Position door assembly (5) on mounting surface.

NOTE

Both hinges are installed following the same procedures.

B Install hinge pin (13) with locknut (14) and washer (15) attached and washer (16).

TA58089 ■

AFES FIRE EXTINGUISHER BOX ASSEMBLY (VEHICLES 345 AND ABOVE): REMOVAL, DISASSEMBLY, ASSEMBLY, AND INSTALLATION (CONTINUED)

C Install washer (12) and new locknut (11).

D Install door handle (10).

E Install latch plate (9), washer (8), and nut (7).

F Install new cotter pin (6) in door handle (10).

G Apply adhesive (item 3, Appx D) to new seals (17) and mounting surface.

H Install new seals (17) to mounting surfaces.

I Close fire extinguisher box door.

INSTALLATION

A Apply adhesive sealant (item 5, Appx D) to mounting of hull and box assembly (4).

B Using suitable lifting device and sling with shackles, lift box assembly.

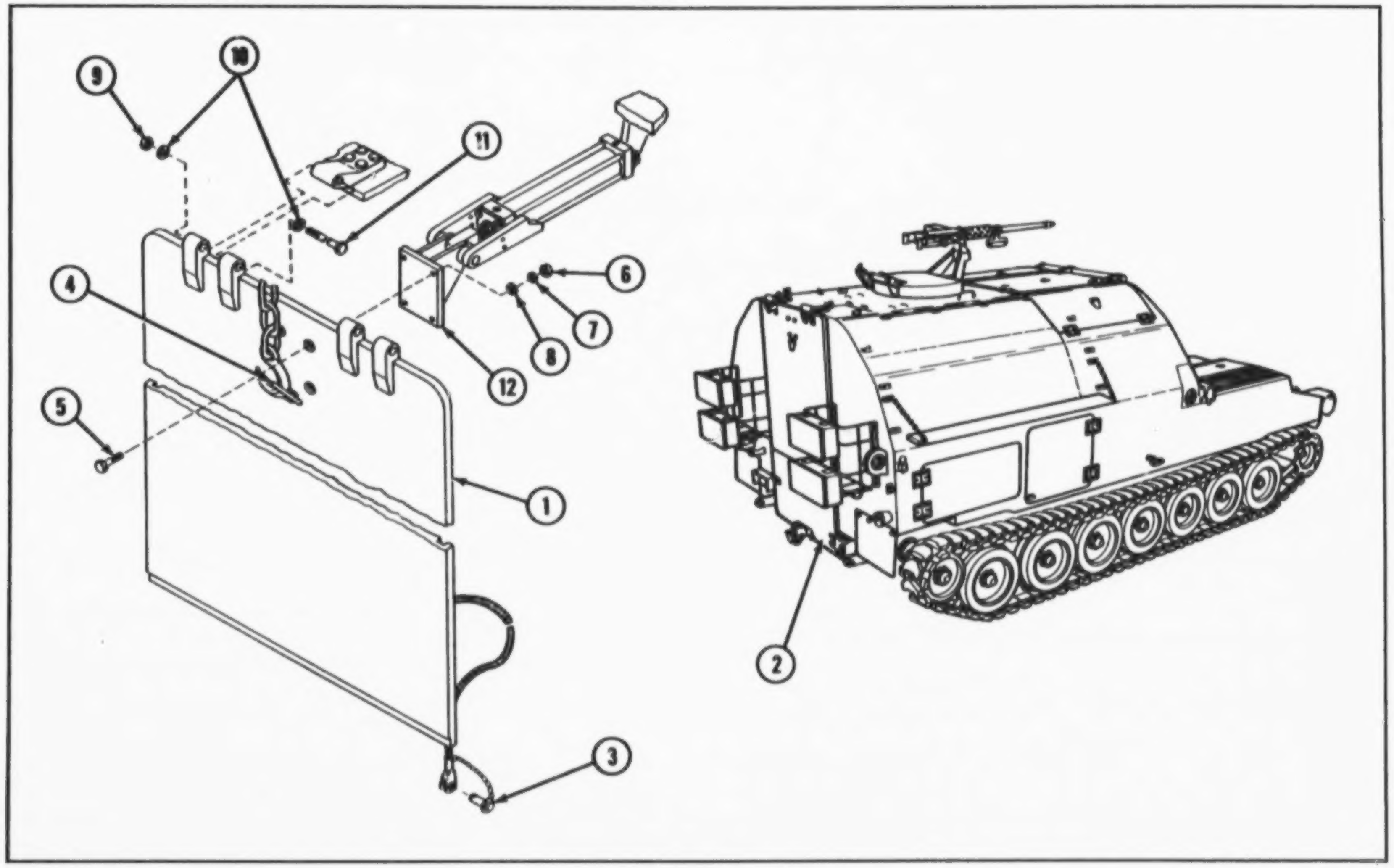
C Install with 13 new lockwashers (3) and 13 screws (2).

D Remove lifting device, sling and shackles from lifting eyes (1).

TA58099

Section III DOORS

UPPER REAR DOOR ASSEMBLY: REMOVAL AND INSTALLATION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TA57260

UPPER REAR DOOR ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

Make sure conveyor is stowed properly (TM 9-2350-267-10).

A Close upper rear door (1) if open.

B Open lower rear door (2).

C Pull two quick-release pins (3) and disconnect two cables from conveyor.

WARNING

Do not make lifting device cable/chain taut. Remove only slack from cable/chain to guard against door dropping when hinge bolts are removed.

D Attach suitable lifting device to upper rear door lifting lug (4). Remove slack from lifting device cable/chain.

CAUTION

To prevent upper rear door actuator from dropping, strap actuator to vehicle ceiling before proceeding to step E.

E Remove four screws (5), four nuts (6), four lockwashers (7) and four flat washers (8).

F From each hinge remove: one nut (9), two flat washers (10) and one bolt (11).

G Remove upper rear door (1) from vehicle.

INSTALLATION

A Attach suitable lifting device to upper rear door lifting lug (4) and lift door (1) into position in vehicle opening.

B Aline hinges and install in each hinge: one bolt (11), two flat washers (10) and one nut (9).

C Install hydraulic actuator bracket (12) to upper rear door with four screws (5), four flat washers (8), four lockwashers (7) and four nuts (6).

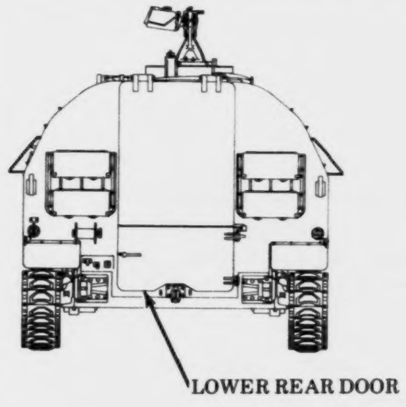
D Install two cables to conveyor and secure with two quick-release pins (3).

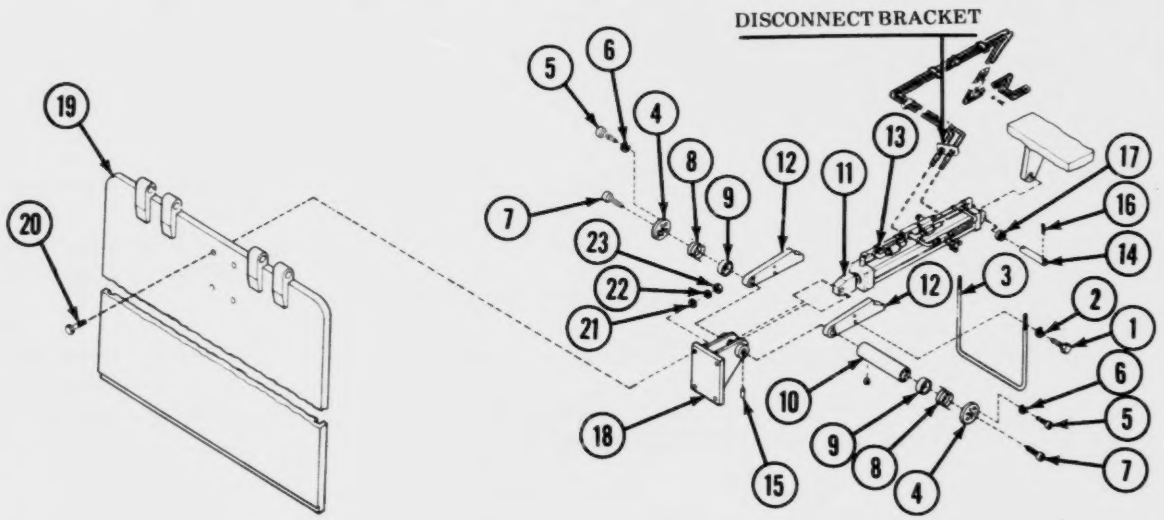
E Remove lifting device from upper rear door lifting lug (4).

F Close lower rear door (2).

TA310015

UPPER REAR DOOR ACTUATOR MOUNTING BRACKET AND HYDRAULIC ACTUATOR: REMOVAL AND INSTALLATION


LOWER REAR DOOR


DISCONNECT BRACKET
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REMOVAL

NOTE

Plier wrench (NSN 5120-00-277-4244) is required for removal and installation of torque plate.

A Open and secure lower rear door.

B Disconnect hydraulic lines from hydraulic actuator hydraulic line disconnect bracket (p 16-30).

C Remove four screws (1), four lockwashers (2) and doorstop handle (3).

CAUTION

Torque plates (4) are spring-loaded and will unwind rapidly when screws (5) are removed.

NOTE

Steps D and E apply to both left and right spring-loaded torque plates.

D Hold torque plate (4) with plier wrench to prevent turning, and remove two screws (5) and two lockwashers (6). Allow torque plate to unwind.

E Remove screw (7), torque plate (4), spring (8) and spacer (9).

TA310016

UPPER REAR DOOR ACTUATOR MOUNTING BRACKET AND HYDRAULIC ACTUATOR: REMOVAL AND INSTALLATION (CONTINUED)

CAUTION

When pivot pin (10) is removed from actuator rod eye (11) and doorstops (12), hydraulic actuator (13) will drop. Hold actuator to prevent damage. Allow actuator to hang from vehicle ceiling until actuator pin (14) is removed.

F Remove right and left doorstops (12). Remove two setscrews (15) and drive pivot pin (10) from rod eye (11) while holding rod end of actuator.

G Hold hydraulic actuator (13) and remove two cotter pins (16) from actuator pin (14). Drive actuator pin (14) free of hydraulic actuator (13) and ceiling-mounted support bracket. Remove two spacers (17) and hydraulic actuator (13).

H Remove mounting bracket (18) from top rear door (19) by removing four screws (20), four flat washers (21), four lockwashers (22) and four nuts (23).

I Unscrew actuator rod eye (11) from piston rod of hydraulic actuator (13).

INSTALLATION

A Install actuator rod eye (11) on piston rod end of actuator (13).

B Install mounting bracket (18) on inside of top rear door (19) by installing four screws (20), four flat washers (21), four lockwashers (22) and four nuts (23).

C Install hydraulic actuator (13) by installing actuator pin (14) and two spacers (17). Install two cotter pins (16) into actuator.

NOTE

Flats on pivot pin (10) must line up with setscrew holes in mounting bracket (18).

D Install pivot pin (10) and secure with setscrews (15).

E Install on each end of pivot pin (10), one spacer (9) and one spring (8). Insert end of each spring into holes on left and right doorstops (12).

F Place one torque plate (4) on left and right ends of pivot pin (10) and press ends of springs (8) into small hole of each torque plate (4).

G Install screws (7) into center hole of torque plates (4) and pivot pin (10).

H Rotate each torque plate (4) (using plier wrench) approximately one rotation in clockwise direction to load springs (8). Hold springs in loaded position and install two screws (5) and two lockwashers (6) in each torque plate (4).

I Reconnect hydraulic lines to hydraulic actuator (13) (p 16-30).

J Close and latch lower rear door.

TA310017

UPPER REAR DOOR HINGES: REMOVAL AND INSTALLATION

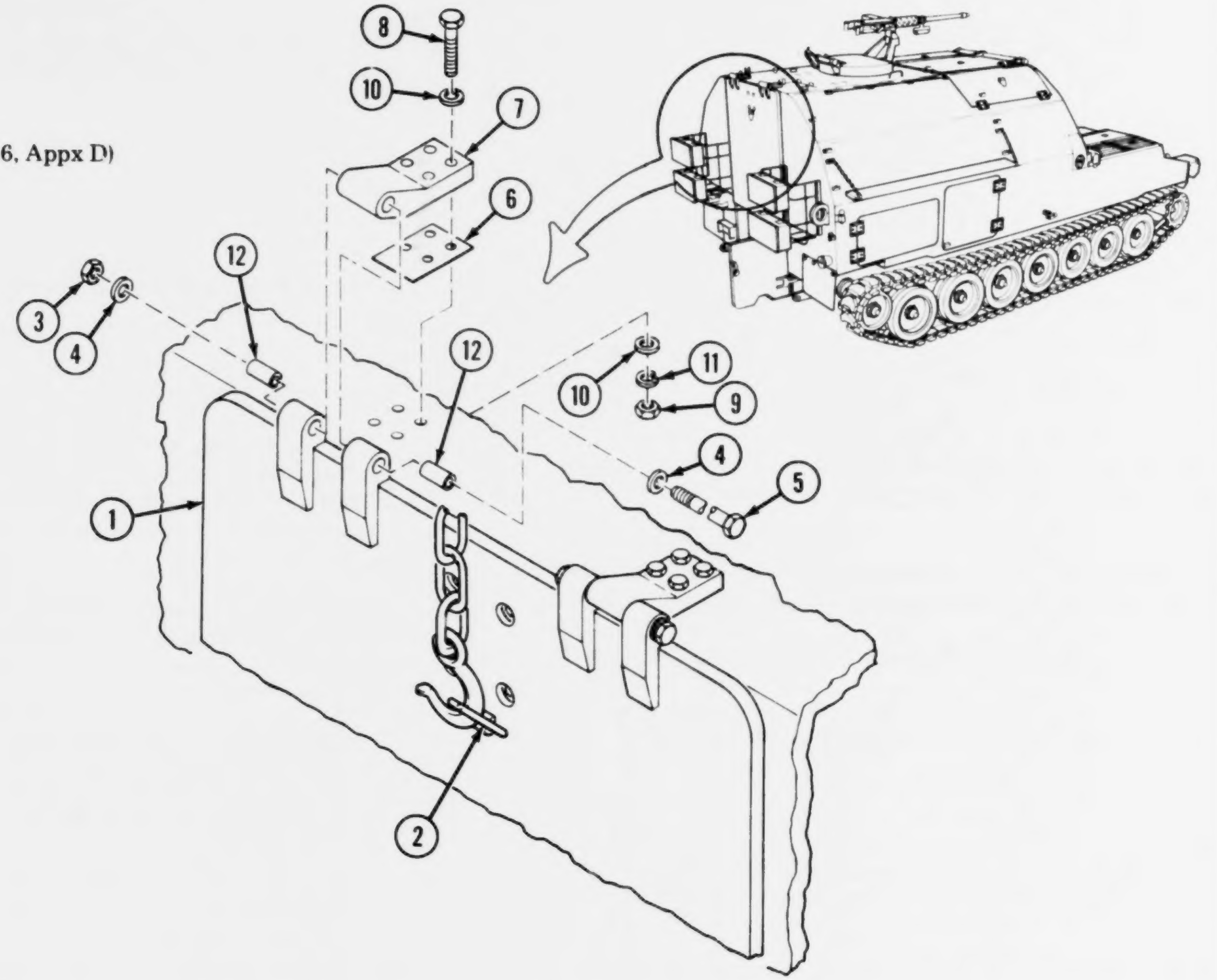
INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two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TA312931

UPPER REAR DOOR HINGES: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

This procedure applies to both upper rear door hinges.

A Open bottom rear door. Close top rear door (1).

WARNING

Do not remove both hinge screws at same time. Do not make lifting device cable/chain taut. Only remove slack from cable/chain to guard against door dropping when one hinge screw is removed.

B Attach suitable lifting device to door lifting lug (2). Remove slack from lifting device cable/chain.

C Remove one self-locking nut (3), two flat washers (4) and one hinge screw (5). Discard self-locking nut.

NOTE

Note location and number of shims during removal.

D With assistant inside crew compartment, remove one hinge (7) and shims (6) by removing four screws (8), four nuts (9), eight flat washers (10) and four lockwashers (11). Discard lockwashers.

E Drive sleeve bearings (12) from hinge bosses of door (1) using drive punch and hammer.

INSTALLATION

A Install sleeve bearings (12) in hinge bosses of door (1).

B Apply zinc chromate paste (item 46, Appx D) between mating surfaces of hinge (7) and shims (6) and vehicle hull.

NOTE

Install same number of shims that were removed from under hinge.

C Install shims (6) and hinge (7) on vehicle hull with four screws (8), eight flat washers (10), four new lockwashers (11) and four nuts (9).

D Install hinge screw (5) with two flat washers (4) and new self-locking nut (3).

E Remove lifting device from lifting lug (2).

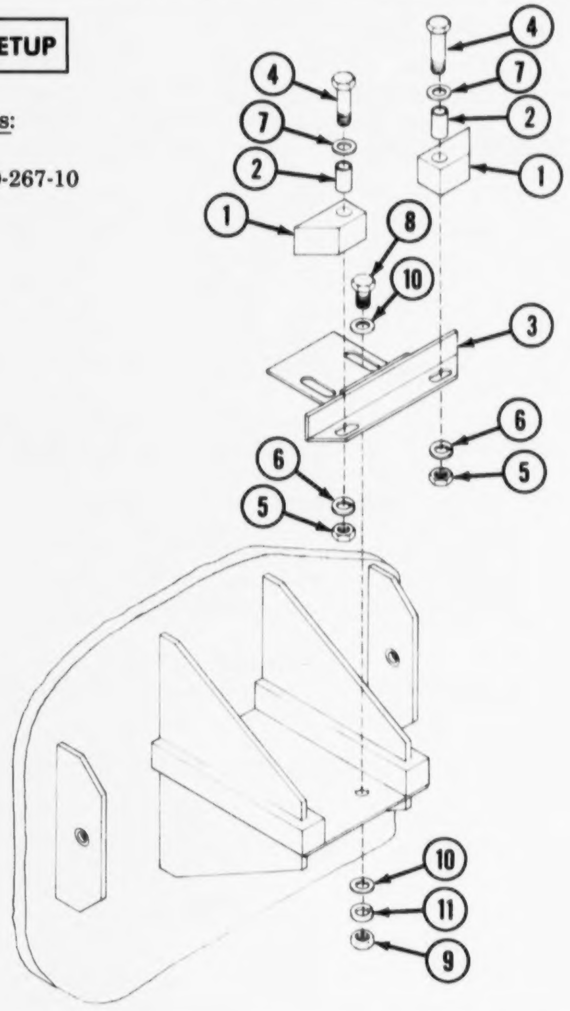
TA312932

UPPER REAR DOOR BUMPER STOP AND BRACKET: REMOVAL AND INSTALLATION

INITIAL SETUP

References:

TM 9-2350-267-10



REMOVAL

A Raise upper rear door to 45-degree stop (TM 9-2350-267-10).

B Remove two bumpers (1) and spacers (2) from bracket (3) by removing from each, one screw (4), one nut (5), one lockwasher (6) and one flat washer (7). Discard lockwasher.

C Remove two screws (8), two nuts (9), four flat washers (10), two lockwashers (11) and bracket (3). Discard lockwashers.

INSTALLATION

A Insert spacers (2) in two bumpers (1).

B Install two bumpers (1) in bracket (3) with two screws (4), two nuts (5), two new lockwashers (6) and two flat washers (7).

C Install bracket (3) on door bracket mount with two screws (8), four flat washers (10), two new lockwashers (11) and two nuts (9). Do not tighten.

D Close upper rear door (TM 9-2360-267-10).

E Push bracket (3) firmly against conveyor assembly and tighten screws (8) and nuts (9).

TA312933

UPPER REAR DOOR SEAL: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

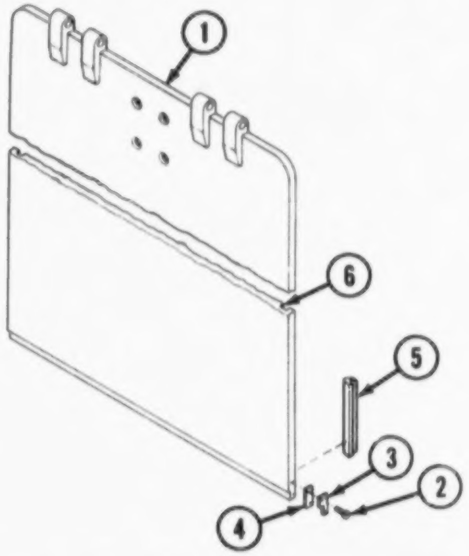
Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)

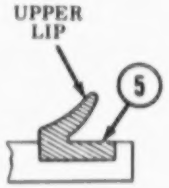
Personnel Required:

Two

References:

TM 9-2350-267-10





REMOVAL

A Open upper rear door (1) to 45-degree stop (TM 9-2350-267-10).

B Remove three screws (2) releasing retainer (3) and seal (4) from door (1).

C Scrape seal (5) from door seal channel (6).

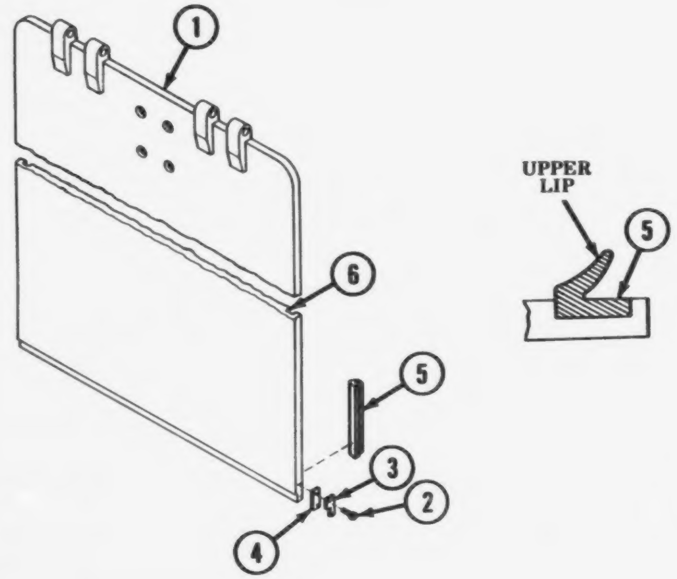
WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

D Use dry-cleaning solvent (item 19, Appx D) and clean rags to thoroughly clean and dry door seal channel (6). Be sure to remove all seal particles.

TA312934

UPPER REAR DOOR SEAL: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTE

Do not exceed 1/4-inch thick application of adhesive. Excessive amount will cause seal lip to adhere to seal channel outer wall, destroying effectiveness of seal.

A Apply thin coating of adhesive (item 4, Appx D) to new seal (5) and door seal channel (6). Allow to dry until tacky.

NOTES

Upper lip on seal must face door edge.

To obtain maximum sealing results, avoid stretching or bunching new seal during installation.

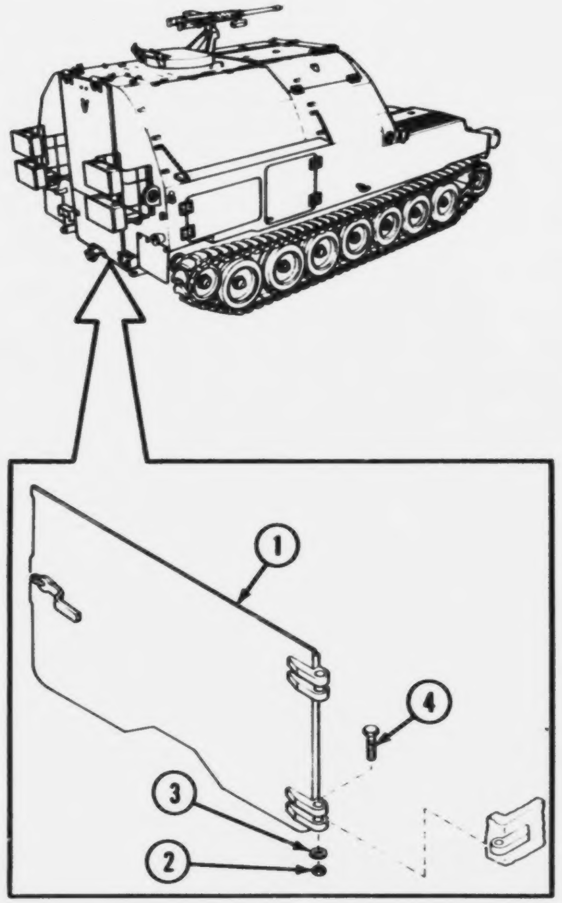
B Install seal (5).

C Install seal (4) and retainer (3). Secure with three screws (2).

D Close upper door (1) (TM 9-2350-267-10).

TA312935

LOWER REAR DOOR: REMOVAL AND INSTALLATION



REMOVAL

A Open lower rear door (1) to approximately 45 degrees.

B Remove fire extinguisher and flashlight from brackets on inside of door.

C With two personnel holding door, remove two nuts (2), two flat washers (3) and two screws (4) from door hinges.

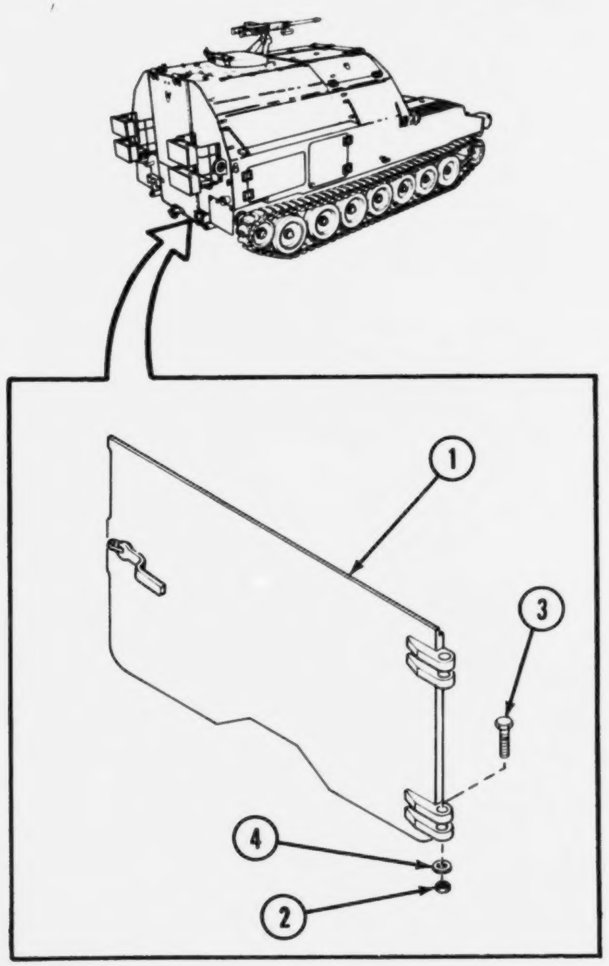
D Lift lower rear door (1) away from vehicle and remove.

INSTALLATION

Reverse removal procedures.

TA310022

LOWER REAR DOOR HINGE SCREWS: REMOVAL AND INSTALLATION



REMOVAL

CAUTION

Only remove and install one hinge screw at a time to prevent door from moving out of place.

A Open lower rear door (1) approximately 45 degrees and support door.

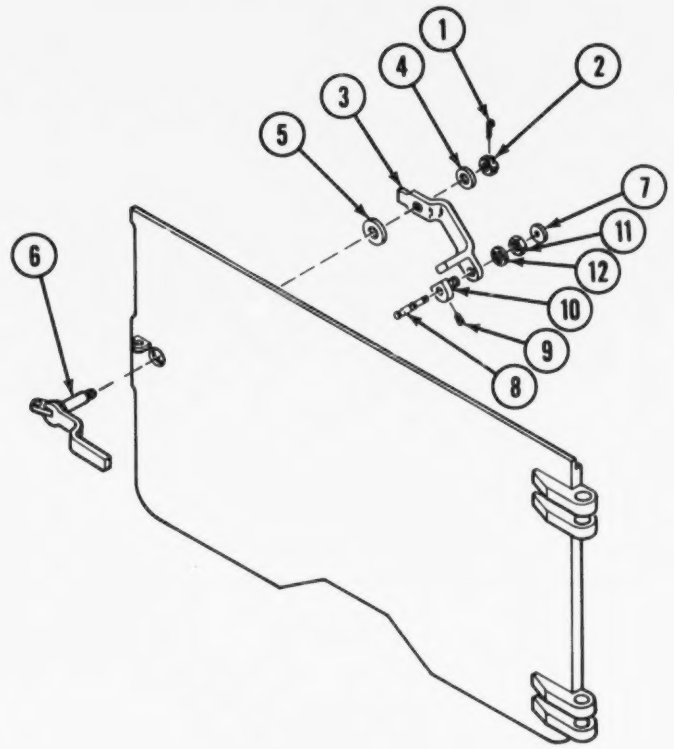
B Remove one nut (2), one screw (3) and one flat washer (4).

INSTALLATION

Reverse removal procedures.

TA310023

LOWER REAR DOOR HANDLE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove cotter pin (1) and slotted nut (2).

B Remove inner door handle (3) and flat washers (4 and 5).

C Remove outer handle (6).

DISASSEMBLY

A Unscrew and remove knob (7) from plunger (8).

B Turn out ball plunger (9) and remove plunger (8) from lock housing (10).

C Remove nut (11), lockwasher (12) and lock housing (10) from handle (3).

ASSEMBLY

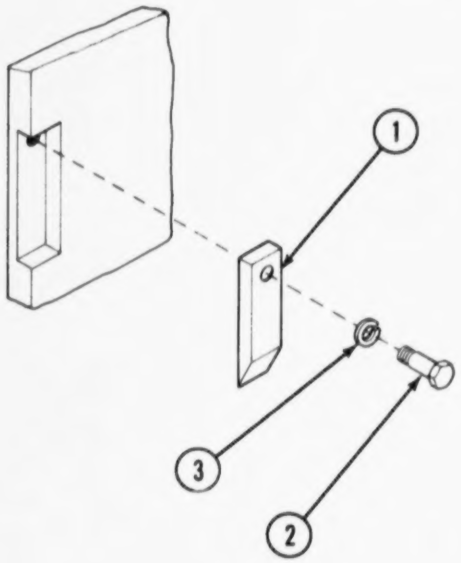
Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

TA310024

LOWER REAR DOOR HANDLE STRIKE: REMOVAL AND INSTALLATION



REMOVAL

To remove door handle strike (1), remove two screws (2) and two lockwashers (3).

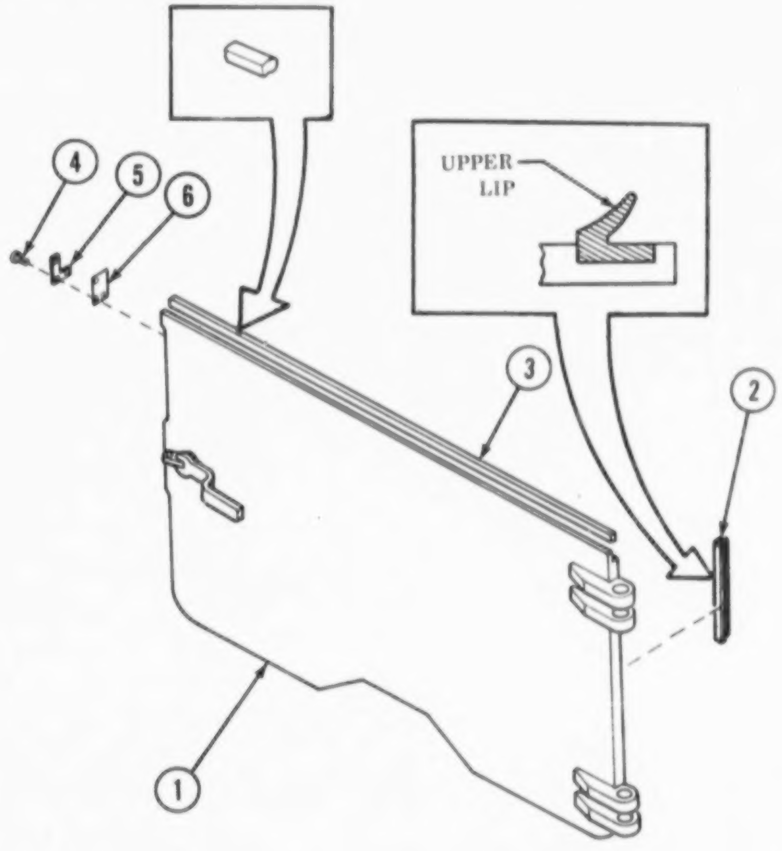
INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of door handle strike (1) and hull.

B Reverse removal procedure.

TA310025

LOWER REAR DOOR SEAL: REMOVAL AND INSTALLATION



REMOVAL

A Open lower rear door (1) fully.

B Remove bottom seal (2) and upper seal (3) and discard. Use solvent (item 19, Appx D) and clean rags (item 50, Appx D) to thoroughly clean and dry door seal channels. Be sure to remove all particles.

C Remove three screws (4), plate (5) and rubber seal (6).

INSTALLATION

NOTES

Upper lip on bottom seal (2) must face door edge.

Do not exceed 1/4-inch application of adhesive to side walls. Excessive amount will cause seal lip to adhere to seal channel outer wall, destroying effectiveness of seal.

A Apply thin coating of adhesive (item 4, Appx D) to both seal channels.

B Allow adhesive to dry until tacky.

C Install bottom seal (2) in door channel with upper lip facing door edge.

D Install upper seal (3) in door channel.

NOTE

To obtain maximum sealing results, avoid stretching or bunching new seals during installation.

E Install rubber seal (6), using three screws (4) and plate (5).

TA310026

PERSONNEL DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Sling, nylon (item 58, Appx B)

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two

REMOVAL

A Open personnel door (1).

B Install nylon sling on personnel door (1). Attach hook of suitable lifting device.

C Remove six screws (2), six nuts (3), six lockwashers (4) and six flat washers (5). Discard lockwashers.

NOTE

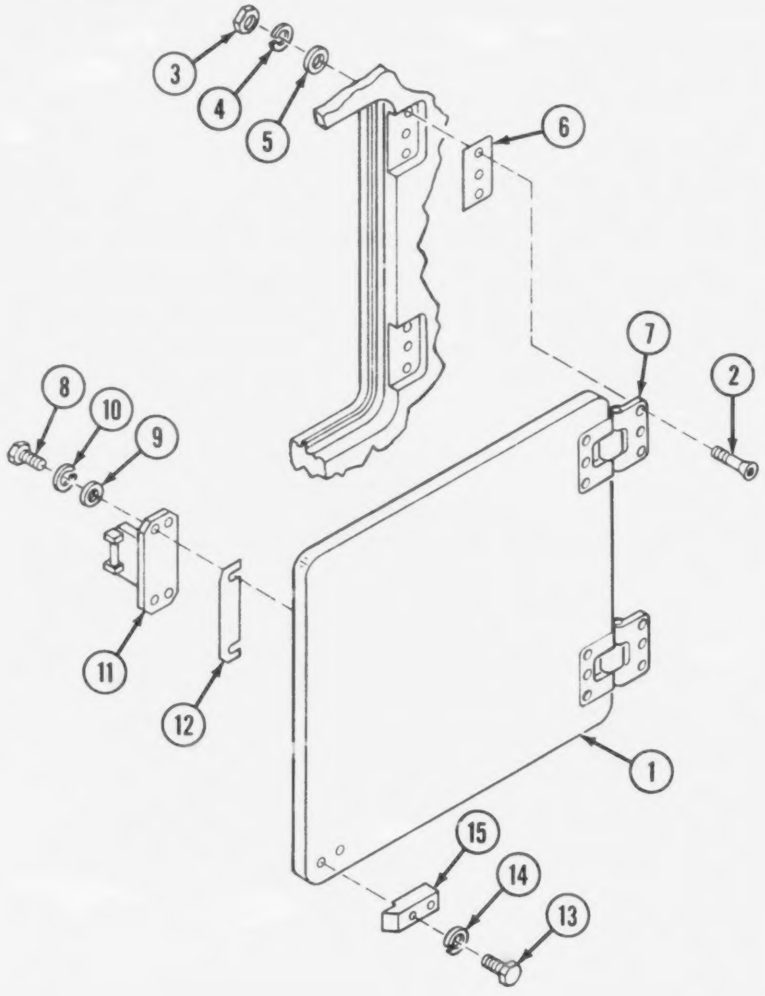
> Note number and position of shims to ensure proper installation.

D Remove door (1), shims (6) and hinges (7).

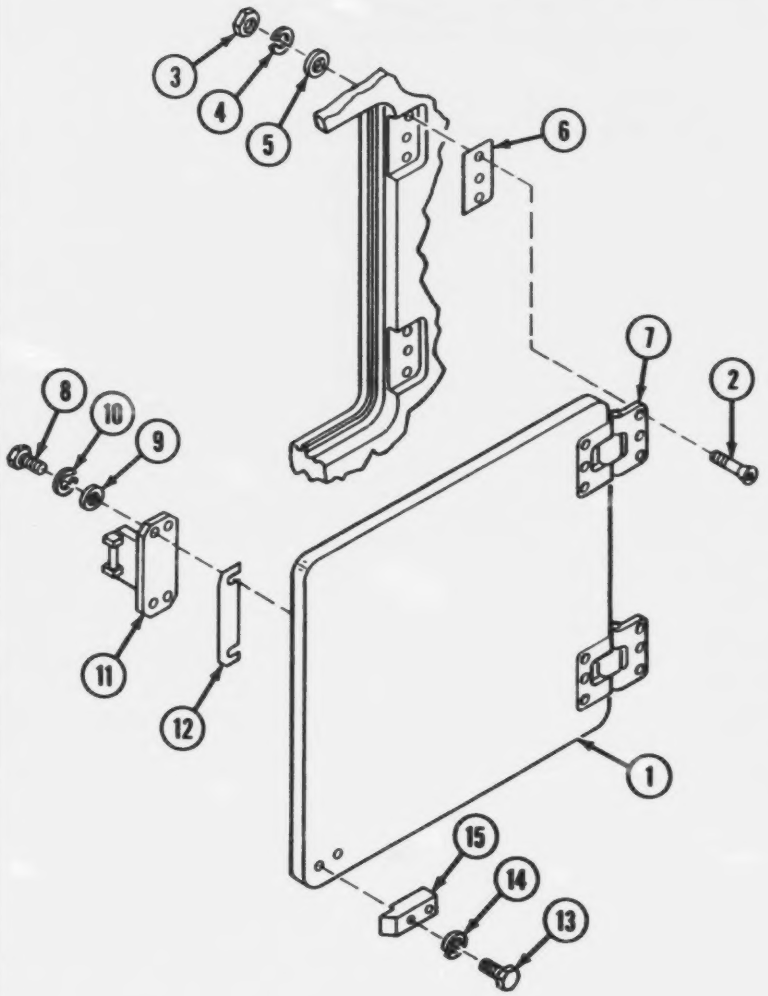
DISASSEMBLY

A Remove four screws (8), four flat washers (9), four lockwashers (10), bracket (11) and shims (12) from door (1). Discard lockwashers.

B Remove two screws (13), two lockwashers (14) and strike (15) from door (1). Discard lockwashers.



PERSONNEL DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of bracket (11), shims (12), strike (15) and door (1).

B Install strike (15) on door (1) with two screws (13) and two new lockwashers (14).

C Install shims (12) and bracket (11) on door (1) with four flat washers (9), four new lockwashers (10) and four screws (8).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of hinges (7), shims (6) and hull.

B Install nylon sling on personnel door (1). Attach hook of suitable lifting device.

C With assistant, lift door (1) into position on vehicle. Position shims (6) between hinges (7) and vehicle hull. Install six screws (2), six flat washers (5), six new lockwashers (4) and six nuts (3). Do not tighten.

D Remove lifting device hook.

E Adjust door (1) as necessary to ensure smooth closing and tighten six nuts (3).

F Close and secure door (1).

TA312937

CANISTER DOORS (VEHICLES 1 THRU 33): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

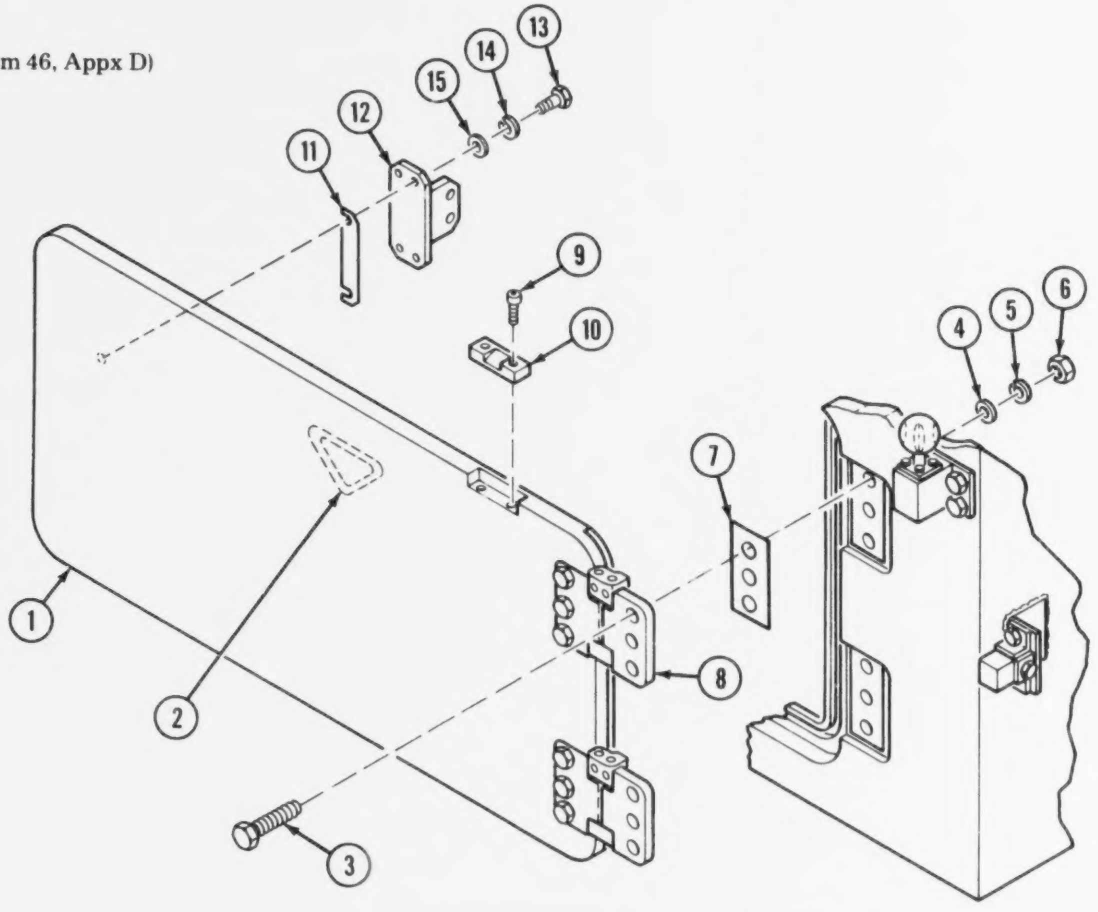
INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two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TA312938

CANISTER DOORS (VEHICLES 1 THRU 33): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

Right and left doors are removed in same manner. The following procedures apply to either door.

A Open canister door (1).

B Attach hook of suitable lifting device to lifting lug (2).

WARNING

Door is heavy. Support door before removing hinges. Door may swing causing personal injury.

C Remove six screws (3), six flat washers (4), six lockwashers (5) and six nuts (6). Discard lockwashers.

NOTE

Note number and position of shims to ensure proper installation.

D Remove door (1), shims (7) and hinges (8).

DISASSEMBLY

A Remove two screws (9) and strike (10) from door (1).

NOTE

Note number and position of shims to ensure proper assembly.

B Remove bracket (12) and shims (11) by removing four screws (13), four lockwashers (14) and four flat washers (15). Discard lockwashers.

ASSEMBLY

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of strike (10), bracket (12), shims (11) and door (1).

B Install bracket (12) and shims (11) with four screws (13), four new lockwashers (14) and four flat washers (15).

C Install strike (10) on door (1) with two screws (9).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surface of hinges (8), shims (7) and hull.

B Attach hook of suitable lifting device to lifting lug (2).

C With assistant, lift door (1) into position on vehicle. Position shims (7) between hinges (8) and vehicle hull. Install six screws (3), six flat washers (4), six new lockwashers (5) and six nuts (6). Do not tighten.

D Remove lifting device hook.

E Adjust door (1) as necessary to ensure smooth closing and tighten six nuts (6).

F Close and secure door.

TA312939

CANISTER DOORS (VEHICLES 34 AND UP): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

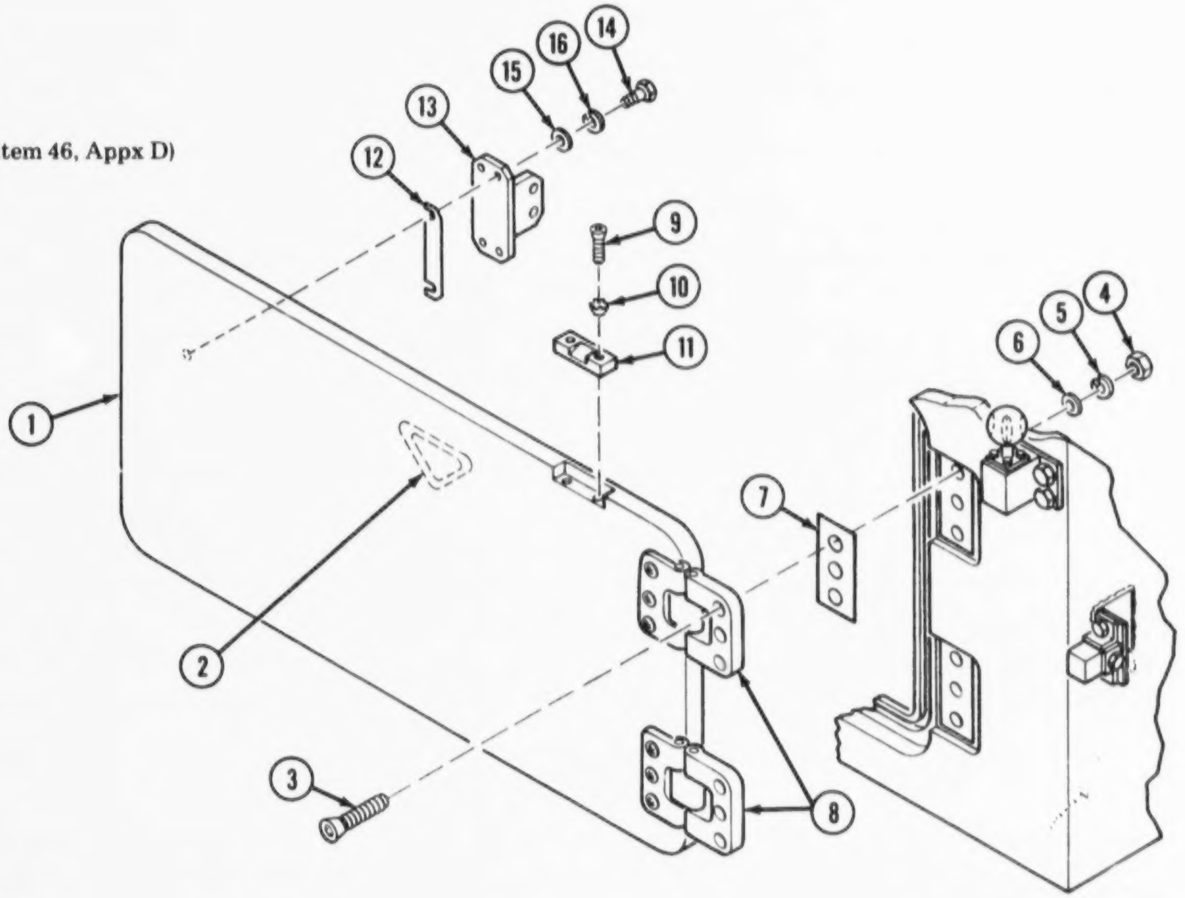
INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two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TA312940

CANISTER DOORS (VEHICLES 34 AND UP): REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

Right and left doors are removed in same manner. The following procedures apply to either door.

A Open canister door (1).

B Attach hook of suitable lifting device to lifting lug (2).

WARNING

Door is heavy. Support door before removing hinges. Door may swing causing personal injury.

C Remove six screws (3), six nuts (4), six lockwashers (5) and six flat washers (6). Discard lockwashers.

NOTE

Note number and position of shims to ensure proper installation.

D Remove door (1), shims (7) and hinges (8).

DISASSEMBLY

A Remove two screws (9), two lockwashers (10) and strike (11) from door (1). Discard lockwashers.

NOTE

Note number and position of shims to ensure proper assembly.

B Remove bracket (13) and shims (12) by removing four screws (14), four flat washers (15) and four lockwashers (16). Discard lockwashers.

ASSEMBLY

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of strike (11), bracket (13), shims (12) and door (1).

B Install bracket (13) and shims (12) with four screws (14), four new lockwashers (16) and four flat washers (15).

C Install strike (11) on door (1) with two screws (9) and two new lockwashers (10).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surface of hinges (8), shims (7) and hull.

B Attach hook of suitable lifting device to lifting lug (2).

C With assistant, lift door (1) into position on vehicle. Position shims (7) between hinges (8) and vehicle hull. Install six screws (3), six new lockwashers (5), six flat washers (6) and six nuts (4). Do not tighten.

D Remove lifting device hook.

E Adjust door (1) as necessary to ensure smooth closing and tighten six nuts (4).

F Close and secure door.

TA312941

LEFT CANISTER DOOR LATCH ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

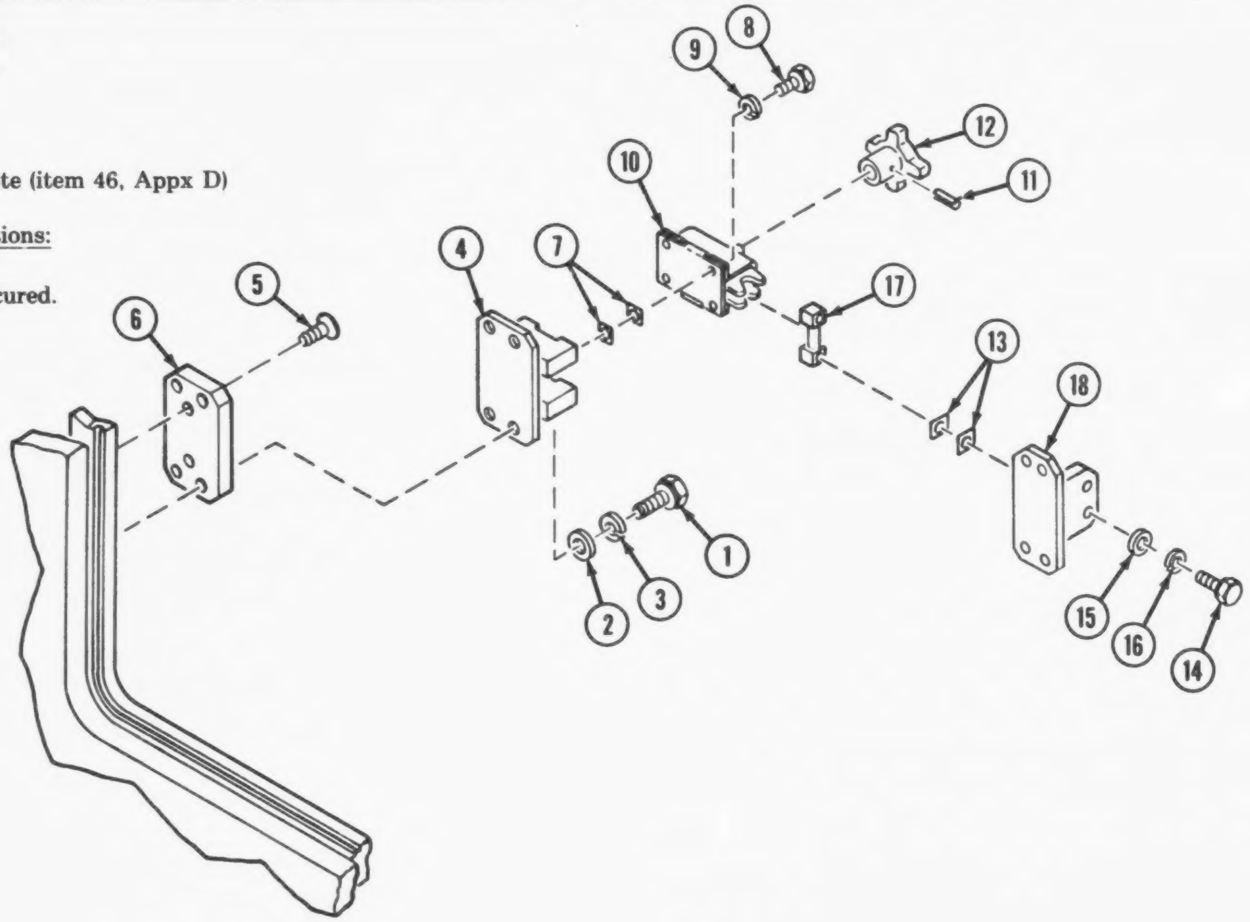
INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Equipment Conditions:

Door open and secured.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TA312942

LEFT CANISTER DOOR LATCH ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

A Remove four screws (1), four flat washers (2), four lockwashers (3) and plate (4) from inside vehicle hull. Discard lockwashers.

B For vehicles 34 and up only, remove two screws (5) releasing spacer (6) from hull.

DISASSEMBLY

NOTE

Note number and position of shims to ensure proper assembly.

A Remove four screws (8), four lockwashers (9), latch assembly (10) and shims (7) from plate (4). Discard lockwashers.

B Remove spring pin (11) and handle (12) from latch assembly (10). Discard spring pin.

C Remove two screws (14), two flat washers (15), two lockwashers (16), shims (13) and strike (17) from door-mounted bracket (18). Discard lockwashers.

ASSEMBLY

A Install shims (13) and strike (17) on door-mounted bracket (18) with two screws (14), two new lockwashers (16) and two flat washers (15).

B Install handle (12) on latch assembly (10) with new spring pin (11).

C Install latch assembly (10) and shims (7) on plate (4) with four screws (8) and four new lockwashers (9).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mounting surfaces of plate (4) or spacer (6) and vehicle hull.

B For vehicle 34 and up only, install spacer (6) on hull with two screws (5).

C Install plate (4) and attached parts on hull or spacer (6) with four screws (1), four flat washers (2) and four new lockwashers (3).

TA312943

CANISTER DOOR LATCH ASSEMBLY (RIGHT SIDE) AND PERSONNEL SIDE DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

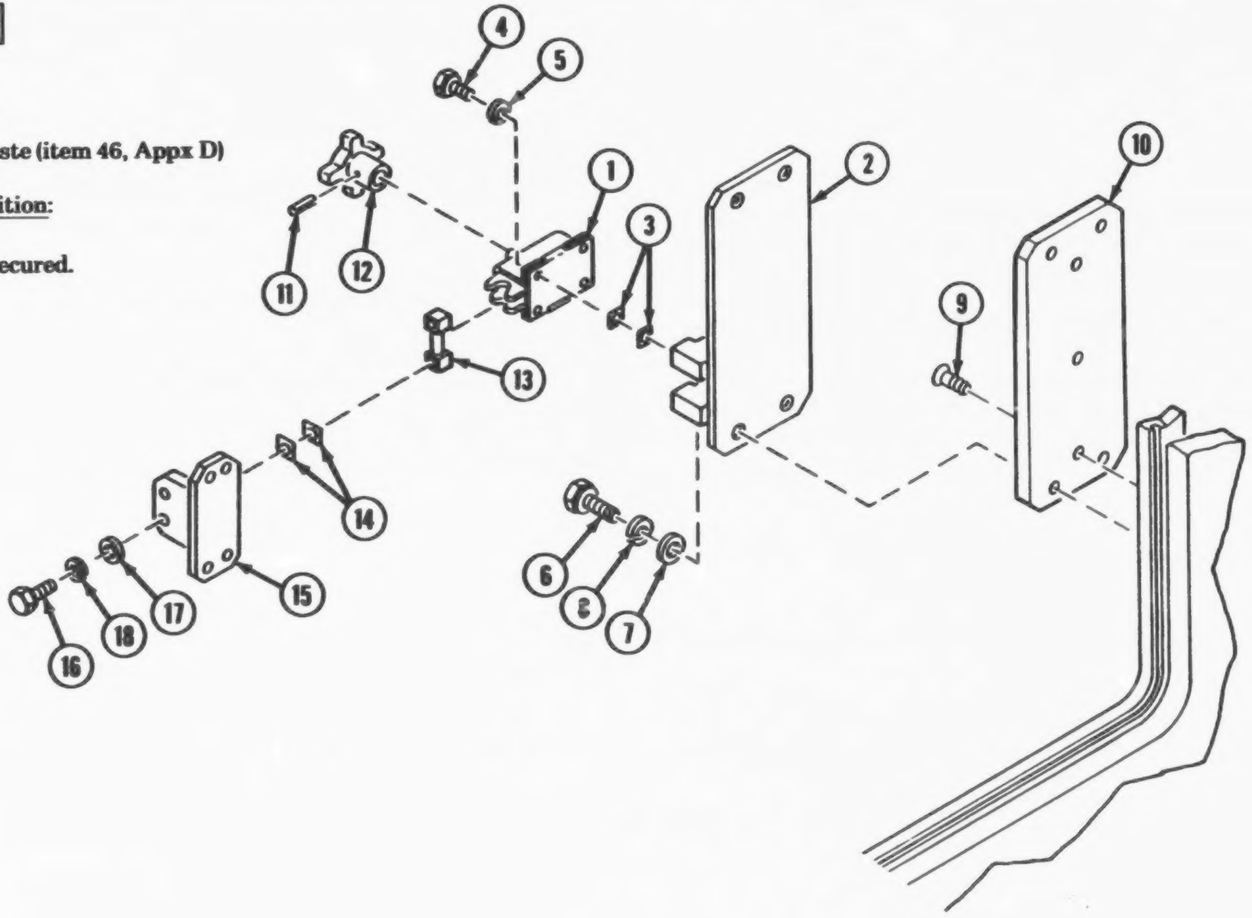
INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Equipment Condition:

Doors open and secured.



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TA312944

CANISTER DOOR LATCH ASSEMBLY (RIGHT SIDE) AND PERSONNEL SIDE DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

NOTES

Latch for personnel door is mounted on top half of plate between right canister door and personnel door. Procedures are identical.

Note number and position of shims to ensure proper installation.

A Remove two latch assemblies (1) from plate (2) by removing from each, four screws (4) and four lockwashers (5). Remove and set aside shims (3). Discard lockwashers.

B Remove plate (2) from vehicle hull by removing four screws (6), four flat washers (7) and four lockwashers (8). Discard lockwashers.

C For vehicles 34 and up only, remove three screws (9), releasing spacer (10) from hull.

DISASSEMBLY

A Remove spring pin (11) and handle (12) from each latch (1). Discard spring pin.

B Remove strike (13) and shims (14) from two door-mounted brackets (15) by removing from each bracket, two screws (16), two flat washers (17) and two lockwashers (18). Discard lockwashers.

ASSEMBLY

A Install shims (14) and strike (13) on door-mounted brackets (15) with two screws (16), two flat washers (17) and two new lockwashers (18).

B Install handle (12) on each latch (1) with new spring pin (11).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surface of plate (2) or spacer (10) and vehicle hull.

B On vehicles 34 and up only, install spacer (10) on hull with three screws (9).

C Install plate (2) on hull or on spacer (10) with four screws (6), four flat washers (7) and four new lockwashers (8).

D Install shims (3) and latch assemblies (1) on plate (2) with four screws (4) and four new lockwashers (5).

TA312945

HINGES, CANISTER DOORS AND PERSONNEL DOOR (VEHICLES 1 TO 33): REMOVAL, ASSEMBLY AND INSTALLATION

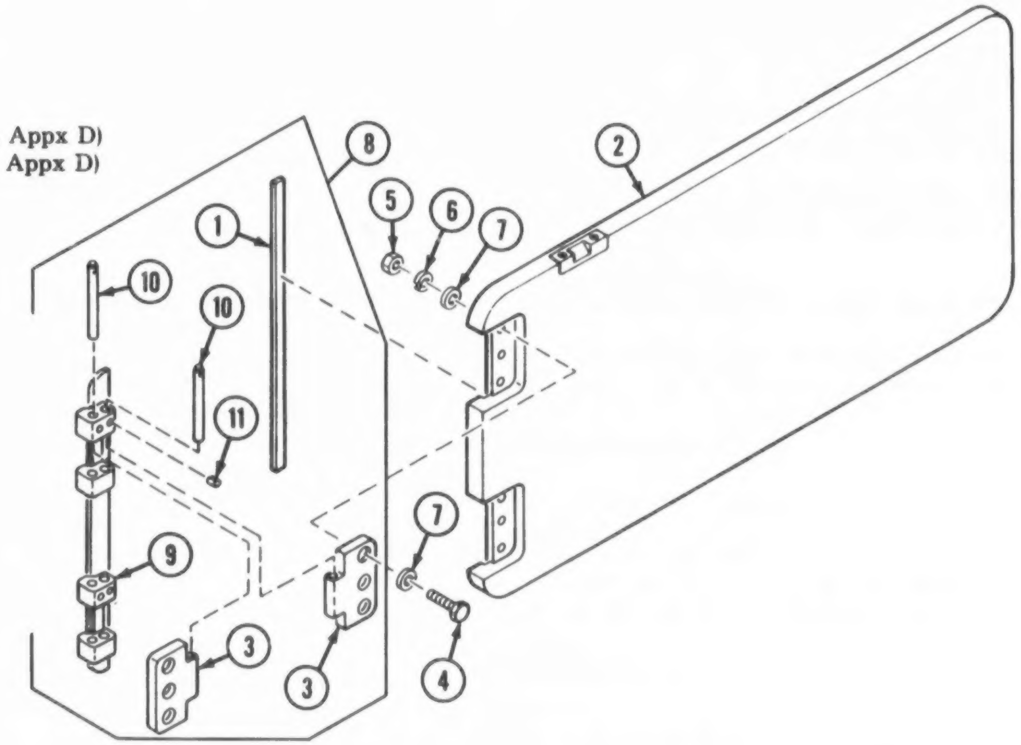
INITIAL SETUP

Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)
Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two



REMOVAL

NOTE

Hinging of canister doors and personnel door is similar. The following procedures apply to all three doors.

A Remove appropriate door (p 9-41 or 9-42.2).

B Scrape hinge seal (1) from seal channel at hinge edge of door (2) and hinge leaves (3). Discard seal.

C Remove six screws (4), six nuts (5), six lockwashers (6), and 12 flat washers (7). Remove hinge assembly (8). Discard lockwashers.

TA312946

HINGES, CANISTER DOORS AND PERSONNEL DOOR (VEHICLES 1 TO 33): REMOVAL, ASSEMBLY AND INSTALLATION (CONTINUED)

ASSEMBLY

NOTE

If new hinge is to be installed, assemble pieces as follows.

A Install four hinge leaves (3) on bar (9) and drive pins (10) through links of bar and hinge leaves. Make sure holes in pins (10) are positioned to aline with holes in links of bar (9).

B Secure each of four pins (10) with spring pin (11).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of each hinge leaf (3) and door (2).

B Install hinge assembly (8) on door (2) with six screws (4), 12 flat washers (7), six new lockwashers (6) and six nuts (5).

C Apply thin even coat of adhesive (item 4, Appx D) to new seal (1) and seal channel. Allow to dry until tacky (approximately 5 minutes).

CAUTION

Be careful to avoid stretching or bunching seal. Sealing will be ineffective.

D Press middle of seal (1) onto hinge edge of door, then work toward top and bottom of door. Maintain pressure on seal (1) and on hinge leaves (3).

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

E Clean all adhesive from face of seal, using dry-cleaning solvent (item 19, Appx D).

F Allow adhesive to cure for 30 minutes. Install appropriate door (p 9-41 or 9-42.2).

TA312947

HINGES, CANISTER DOORS AND PERSONNEL DOOR (VEHICLES 34 AND UP): REMOVAL, AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

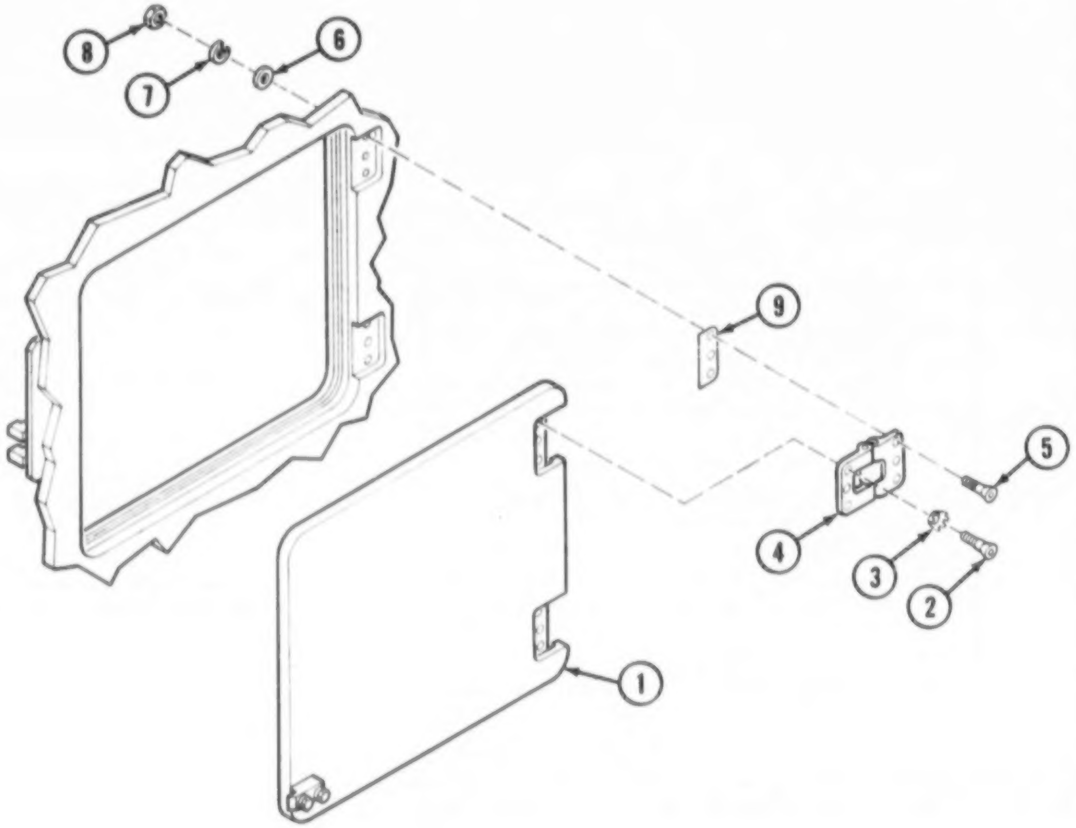
Sling, nylon (item 58, Appx B)

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two



TA312948

HINGES, CANISTER DOORS AND PERSONNEL DOOR (VEHICLES 34 AND UP): REMOVAL, AND INSTALLATION

REMOVAL

WARNING

Remove only one hinge assembly at a time. With both hinges off, door could fall, inflicting serious injury.

NOTE

Hinge assemblies for canister doors and personnel side door are similar. The following procedures apply to all three hinge assemblies.

A Open appropriate door (1).

B Install sling on door (1). Attach hook of suitable lifting device. Take up slack in sling to hold door taut.

C Remove three screws (2) and (from personnel door only) three lockwashers (3) releasing hinge assemblies (4) from door (1). Discard lockwashers.

NOTE

Note number and position of shims to ensure proper installation.

D Remove three screws (5), three flat washers (6), three lockwashers (7) and three nuts (8). Remove hinge assemblies (4) and shims (9) from vehicle hull. Discard lockwashers.

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of hinge assemblies (4), shims (9), door (1) and vehicle hull.

B Install hinge assemblies (4) and shims (9) with three screws (2) and (personnel door only) three new lockwashers (3).

C Install hinge assemblies (4) and shims (9) on vehicle hull with three screws (5), three flat washers (6), three new lockwashers (7) and three nuts (8).

D Remove sling from door (1) and suitable lifting device.

E Close and secure appropriate door.

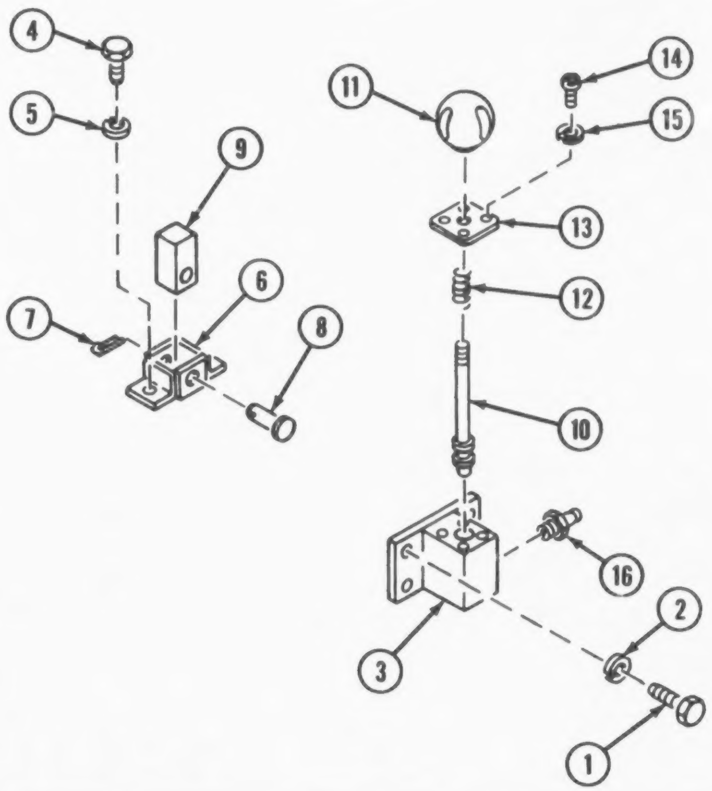
TA312949

CANISTER DOORS HOLD-OPEN LATCH AND BUMPER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)



REMOVAL

NOTE

Hold-open latches and bumper assemblies for right and left canister doors are removed and disassembled in same manner. The following procedures apply to both hold-open latches and bumper assemblies.

A Remove four screws (1), four lockwashers (2) and latch body assembly (3) from vehicle hull. Discard lockwashers.

B Remove two screws (4), two lockwashers (5), bumper bracket (6) from vehicle hull. Discard lockwashers.

DISASSEMBLY

A Remove cotter pin (7), headed pin (8) and rubber bumper (9) from bumper bracket (6). Discard cotter pin.

B Hold pin (10). Unscrew knob (11).

NOTE

Spring is under pressure. Hold cover until screws are removed.

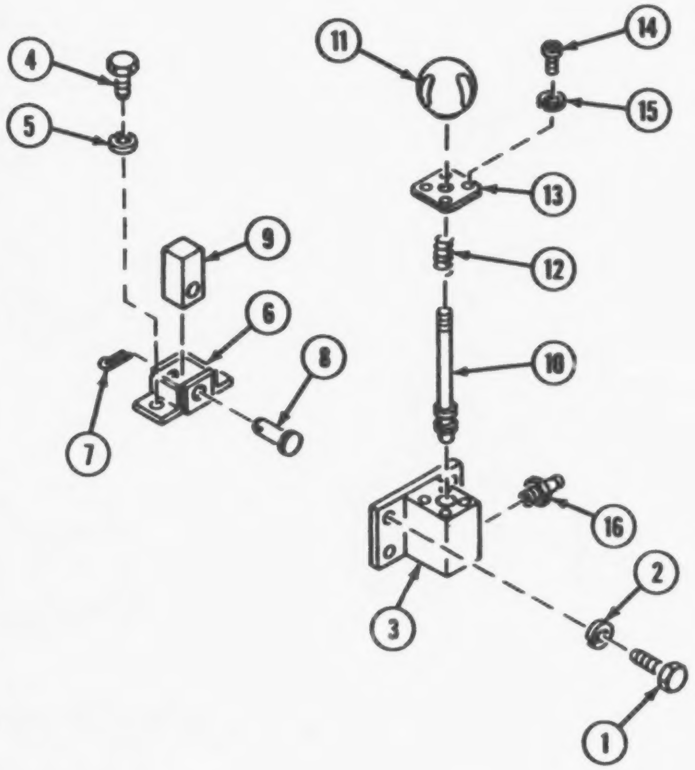
C Remove four screws (14) and four lockwashers (15). Remove cover (13) from latch body assembly (3). Discard lockwashers.

D Remove spring (12) and pin (10) from inside latch body assembly (3).

E Remove lubrication fitting (16) from latch body assembly (3).

TA312950

CANISTER DOORS HOLD-OPEN LATCH AND BUMPER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Install lubrication fitting (16) in latch body assembly (3).

B Install pin (10) and spring (12) in latch body (3).

C Hold cover (13) in position on latch body assembly (3) compressing spring (12). Secure cover (13) to latch body assembly (3) with four screws (14) and four new lockwashers (15).

D Hold pin (10). Screw knob (11) on pin (10).

E Install rubber bumper (9) in bumper bracket (6) with headed pin (8) and new cotter pin (7).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of latch body (3), bumper bracket (6) and vehicle hull.

B Install bumper bracket (6) with two screws (4) and two new lockwashers (5).

C Install latch body assembly (3) with four screws (1) and four new lockwashers (2).

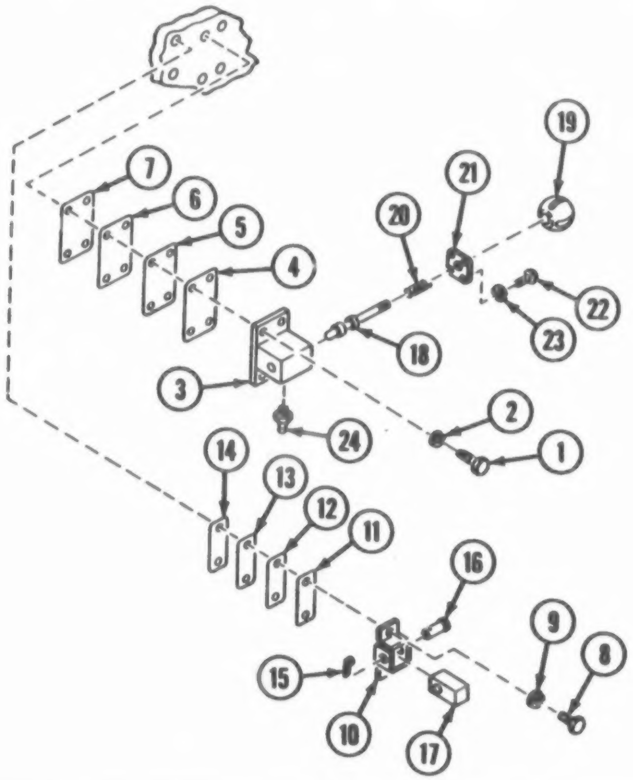
TA312951

PERSONNEL DOOR HOLD-OPEN LATCH AND BUMPER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)



REMOVAL

A Remove four screws (1), four lockwashers (2), latch body assembly (3) and shims (4, 5, 6 and 7) from vehicle hull. Discard lockwashers.

B Remove two screws (8), two lockwashers (9), bumper bracket (10) and shims (11, 12, 13 and 14) from vehicle hull. Discard lockwashers.

DISASSEMBLY

A Remove cotter pin (15), headed pin (16) and rubber bumper (17) from bumper bracket (10). Discard cotter pin.

B Hold pin (18). Unscrew knob (19).

NOTE

Spring is under pressure. Hold cover until screws are removed.

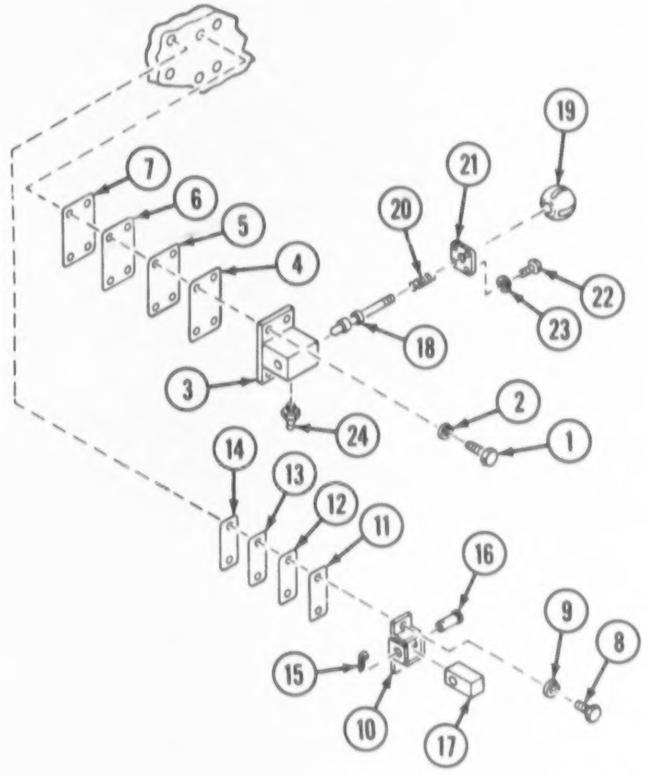
C Remove four screws (22) and four lockwashers (23). Remove cover (21) from latch body assembly (3). Discard lockwashers.

D Remove spring (20) and pin (18) from inside latch body assembly (3).

E Remove lubrication fitting (24) from latch body assembly (3).

TA312952

PERSONNEL DOOR HOLD-OPEN LATCH AND BUMPER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Install lubrication fitting (24) in latch body assembly (3).

B Install pin (18) and spring (20) in latch body assembly (3).

C Hold cover (21) in position on latch body assembly (3) compressing spring (20). Secure cover (21) to latch body assembly (3) with four screws (22) and four new lockwashers (23).

D Hold pin (18). Screw knob (19) on pin (18).

E Install rubber bumper (17) in bumper bracket (10) with headed pin (16) and new cotter pin (15).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of latch body (3), shims (4, 5, 6 and 7) bumper bracket (10), shims (11, 12, 13 and 14) and vehicle hull.

B Install bumper bracket (10) and shims (11, 12, 13 and 14) with two screws (8) and two new lockwashers (9).

C Install latch body assembly (3) and shims (4, 5, 6 and 7) with four screws (1) and four new lockwashers (2).

TA312953

CANISTER DOORWAYS AND PERSONNEL SIDE DOORWAY SEALS: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)

REMOVAL

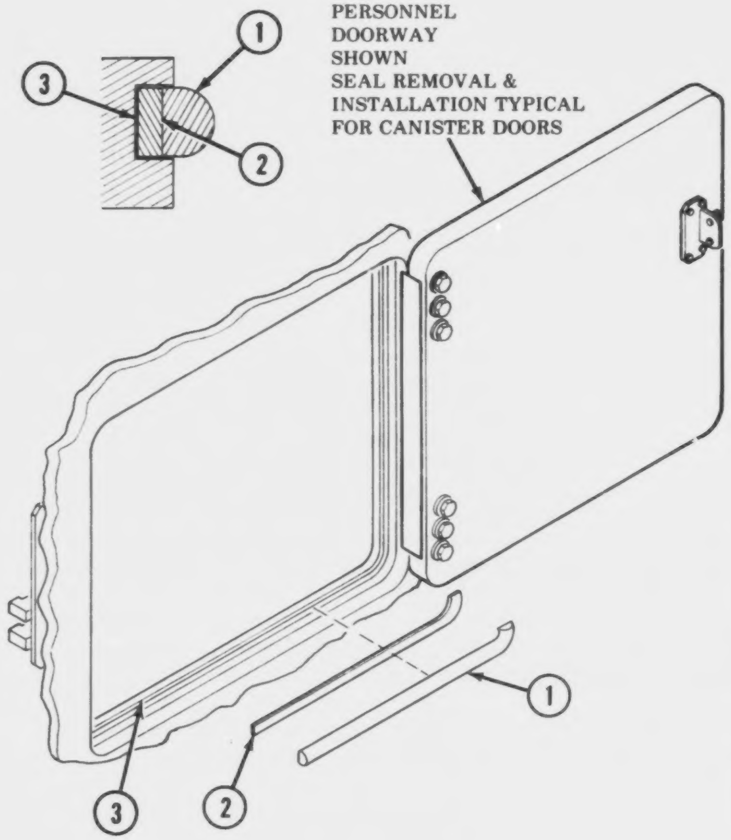
A Open and secure appropriate door.

B Pry up and remove old seal (1) and rubber shim (2) from doorway seal channel (3) of appropriate doorway. Discard seal and shim.

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

C Use dry-cleaning solvent (item 19, Appx D) to thoroughly clean doorway seal channel (3). Use wire brush (item 48, Appx B) and rags, if necessary.



TA312954

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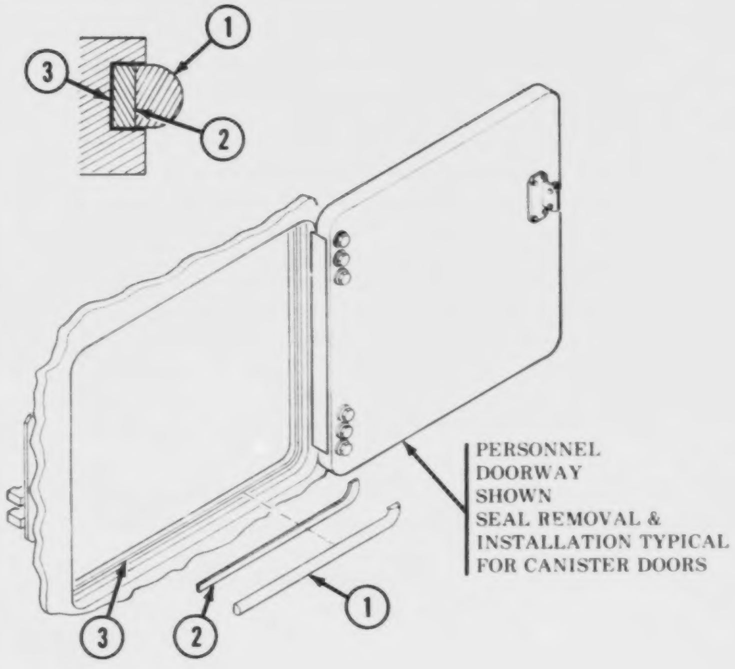
CANISTER DOORWAYS AND PERSONNEL SIDE DOORWAY SEAL: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Apply light coat of adhesive (item 4, Appx D) to mating surfaces of new shim (2) and doorway seal channel (3). Allow to dry until tacky (about 5 minutes).

NOTE

To obtain maximum sealing results, avoid stretching or bunching new shim or new seal during installation.

B Install shim (2). Press in place, working with one end of shim (2) at bottom center of doorframe. Progress around doorframe until ends meet. Trim end if necessary for smooth tight fit.

C Apply light coat of adhesive to front side of shim (2). Allow adhesive to set for about 1 minute.

D Install new seal (1) with round side facing door. Start at bottom center of doorframe. Progress around doorframe as in step B.

E Press seal (1) into firm contact. Start at top center of doorframe. Work away from center, down both sides at once toward ends of seal (1).

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

F Clean seal (1) with dry-cleaning solvent (item 19, Appx D). Any adhesive left on rounded surface will cause seal to stick to door.

G Close and secure door. Allow adhesive to cure for about 30 minutes.

TA312955

PERSONNEL DOOR AND COMMANDER'S STATION ASSIST HANDLES: REMOVAL AND INSTALLATION

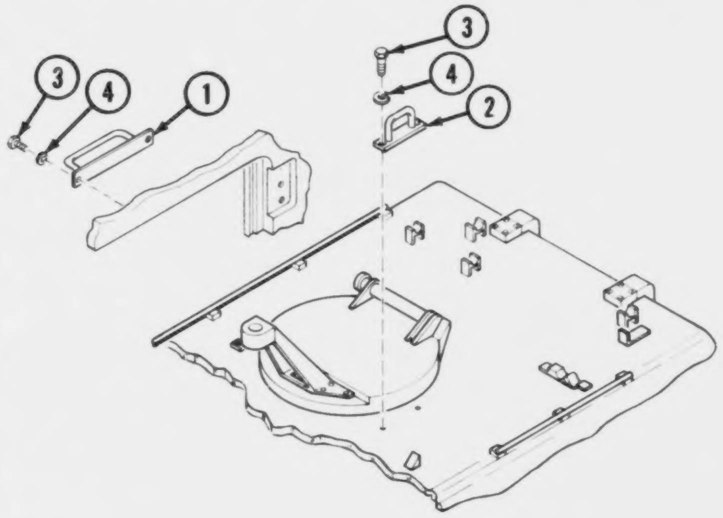
INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Dry-cleaning solvent (item 20, Appx D)
Zinc chromate paste (item 46, Appx D)



NOTE

Personnel door handle is located on interior wall above personnel door.

REMOVAL

Remove personnel door handle (1) or commander's station assist handle (2) by removing two screws (3) and two lockwashers (4). Discard lockwashers.

INSTALLATION

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

A Clean handle (1 or 2) mounting surface and surface of hull with dry-cleaning solvent (item 20, Appx D) and wire brush (item 48 , Appx B).

B Apply zinc chromate paste (item 46, Appx D) between mating surfaces of handle (1 or 2) and hull.

C Install personnel door handle (1) or commander's station assist handle (2) using two screws (3) and two new lockwashers (4).

TA312956

TOP LEFT DOOR: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Vise

Materials/Parts:

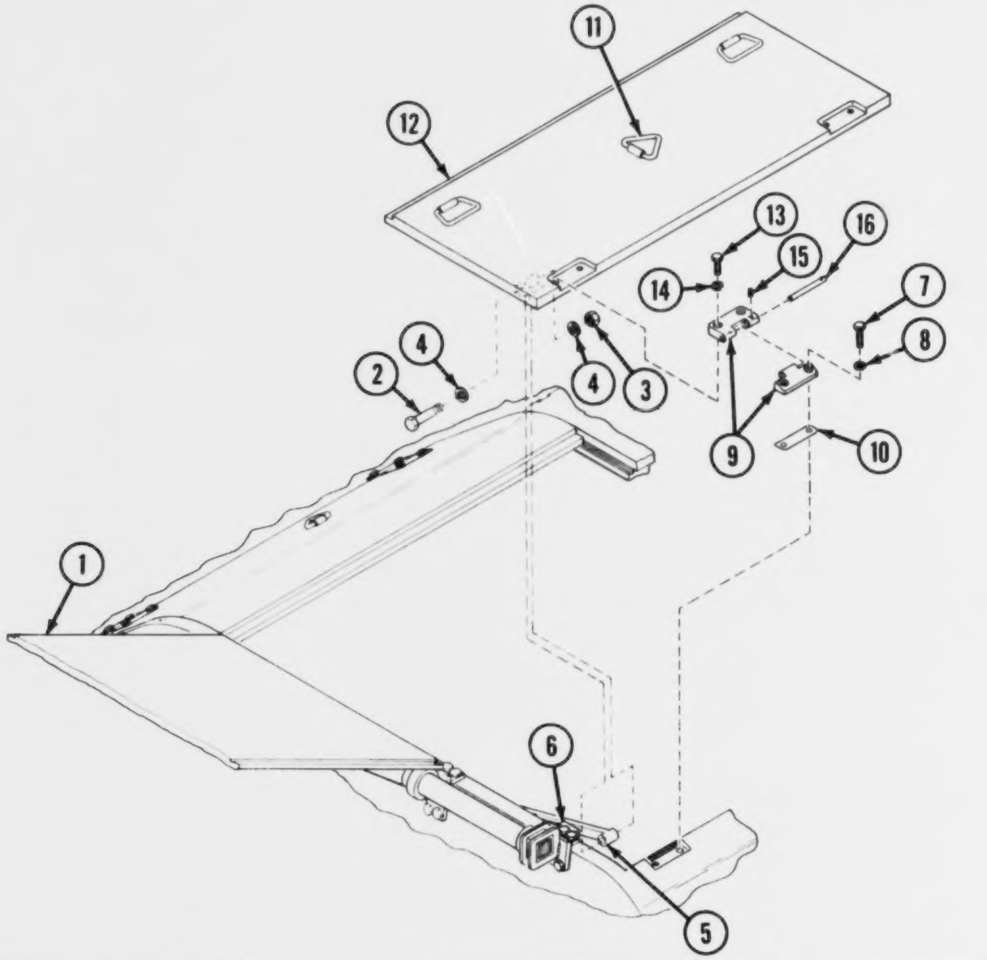
Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two

Equipment Condition:

Outer seals and retainers removed (p 9-58.3).



TA312957

TOP LEFT DOOR: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Open and secure top middle door (1).

B Remove screw (2), self-locking nut (3) and two flat washers (4) and allow hold-open bar (5) to hang from support (6). Discard self-locking nut.

NOTE

Note number and position of shims to ensure proper installation.

C Remove four screws (7) and four lockwashers (8), releasing two hinges (9) and shims (10). Discard lockwashers.

D Attach lifting hook of suitable lifting device to door lifting lug (11) and lift door (12) off vehicle.

E Remove two hinges (9) from door (12) by removing four screws (13) and four lockwashers (14). Discard lockwashers.

F Separate two hinge halves (9) by removing spring pin (15) and driving out hinge pin (16). Discard spring pin.

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) to mating surfaces between hinges (9), shims (10), door (12) and vehicle.

B Hold one hinge half (9) in vise, with holes for spring pin (15) facing up. Position mating hinge half (9). Aline hinge pin holes. Drive hinge pin (16) into place, using care to aline holes for spring pin (15). Secure with new spring pin (15).

C Attach lifting hook of suitable lifting device to door lifting lug (11). Lift door (12) into position on vehicle.

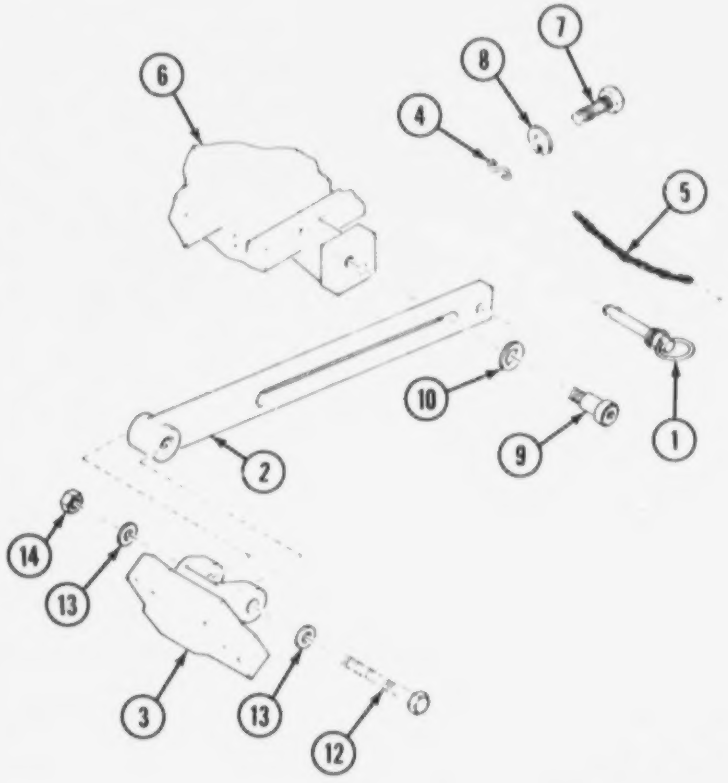
D Install two hinges (9) on top left door (12) with four screws (13) and four new lockwashers (14). Position shims (10) between hinges (9) and vehicle hull and install four screws (7) and four new lockwashers (8).

E Install hold-open bar (5) on door (12) bracket with screw (2), two flat washers (4) and new self-locking nut (3).

F Close and secure top middle door (1).

TA312958

TOP LEFT DOOR HOLD-OPEN COMPONENTS: REMOVAL AND INSTALLATION



REMOVAL

A Move left projectile rack (TM 9-2350-267-10).

B Pull quick-release pin (1) from bar (2).

C Close top left door (3).

D Remove S-hooks (4) that secure chain (5) to quick-release pin (1) and support (6). Remove screw (7) and lockwasher (8) from support (6).

E Remove shoulder screw (9) and flat washer (10) from support (6) to free bar (2).

F Remove bar (2) from door-mounted bracket (11) by removing screw (12), two flat washers (13) and nut (14).

INSTALLATION

Reverse removal procedures.

TA310037

TOP RIGHT DOOR: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

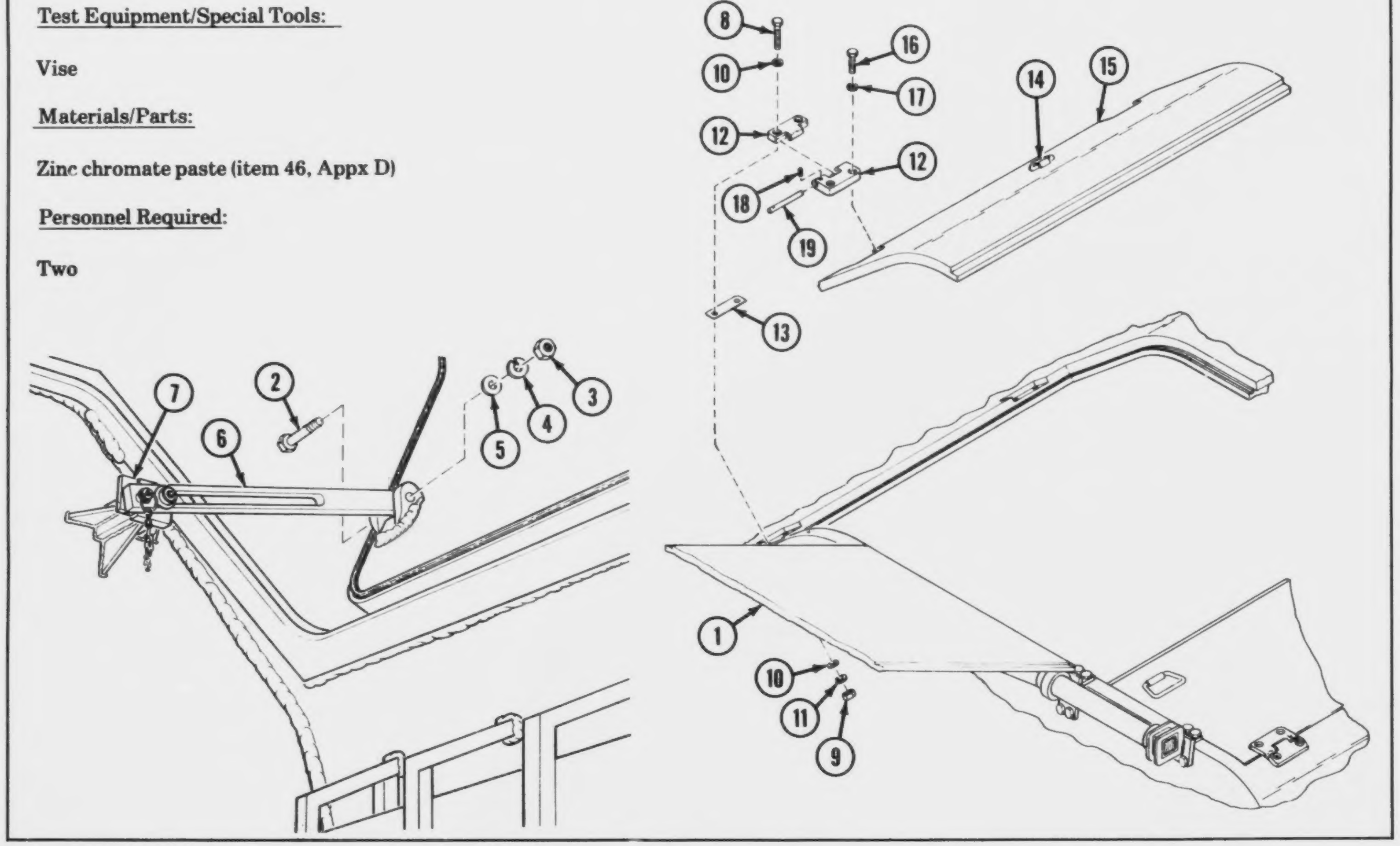
Vise

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two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TA312959

TOP RIGHT DOOR: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Open and secure top middle door (1).

B Remove screw (2), nut (3), lockwasher (4) and flat washer (5), and allow hold-open bar (6) to hang from support (7). Discard lockwasher.

NOTE

Note position and number of shims to ensure proper installation.

C Remove four screws (8), four nuts (9), eight flat washers (10) and four lockwashers (11), releasing hinges (12) and shims (13) from hull. Discard lockwashers.

D Attach lifting hook of suitable lifting device to door lifting lug (14), and lift door (15) off vehicle.

E Remove two hinges (12) from door (15) by removing four screws (16) and four lockwashers (17). Discard lockwashers.

F Remove spring pin (18), and drive hinge pin (19) from hinge halves (12). Separate hinge halves (12). Discard spring pin (18).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) to mating surfaces between hinges (12), shims (13), door (15) and vehicle.

B Hold one hinge half (12) in vise, with holes for spring pin (18) facing up. Position mating hinge half (12). Aline hinge pin holes. Drive hinge pin (19) in place, using care to aline holes for spring pin (18). Secure with new spring pin (18).

C Attach lifting hook of suitable lifting device to door lifting lug (14). Lift door (15) into position on vehicle.

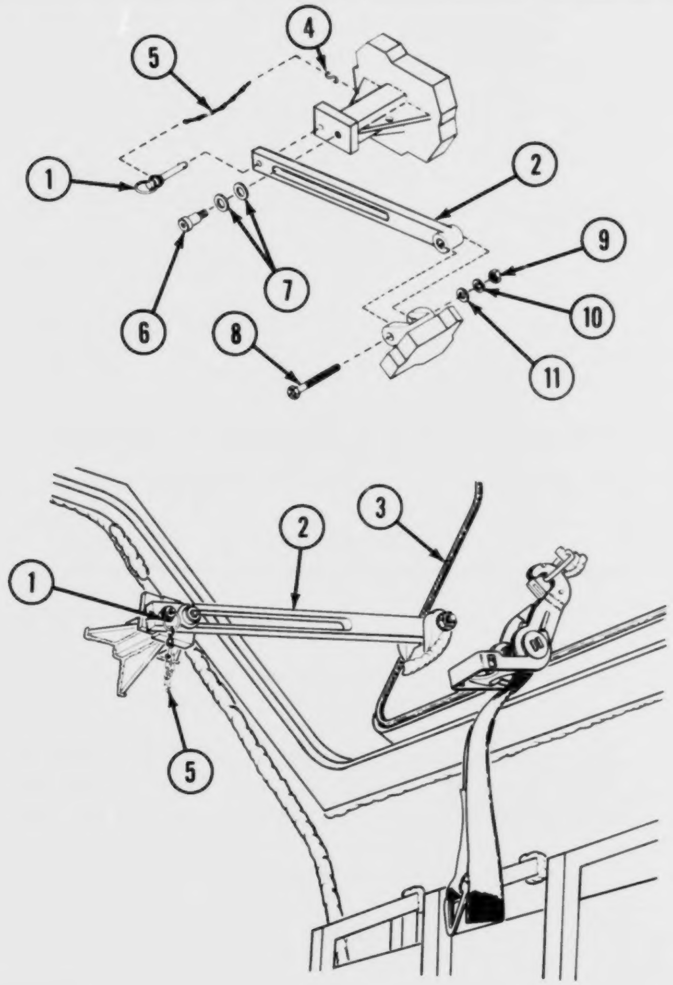
D Install two hinges (12) on top right door (15) with four screws (16) and four new lockwashers (17). Install shims (13) between hinges (12) and vehicle hull and secure with four screws (8), eight flat washers (10), four new lockwashers (11) and four nuts (9).

E Install hold-open bar (6) in door (15) bracket with screw (2), flat washer (5), new lockwasher (4) and nut (3).

F Close and secure top middle door (1).

TA312960

TOP RIGHT DOOR HOLD-OPEN COMPONENTS: REMOVAL AND INSTALLATION



REMOVAL

A Move right projectile rack (TM 9-2350-267-10).

B Pull quick-release pin (1) from bar (2).

C Close top right door (3).

D Remove S-hooks (4) from vehicle-mounted bracket and quick-release pin (1).

E Remove chain (5) from quick-release pin (1).

F Remove shoulder screw (6) and two flat washers (7) from bar (2) and vehicle-mounted bracket.

G Remove bar (2) from door-mounted bracket by removing screw (8), nut (9), lockwasher (10) and flat washer (11).

INSTALLATION

Reverse removal procedures.

TA310039

TOP MIDDLE DOOR: REMOVAL AND INSTALLATION

REMOVAL

NOTE

This procedure requires two personnel.

A Lift and hold top middle door (1) in open position perpendicular to roof of vehicle, and attach lifting hook (2) from suitable lifting device to top middle door lifting lug (3).

B Remove four screws (4) and four lockwashers (5) that secure anchor (6) to vehicle. Remove anchor (6) and shield (7).

C Pull 12 leaf springs (8) from assembly.

CAUTION

Make sure door latch is open before attempting to open door, or latch could be broken.

D Close door (1) and remove three screws (9) and three lockwashers (10) that secure hinge (11) to vehicle. Remove hinge (11) and washer (12).

E Remove shield (13).

F To remove hinge (14), remove three screws (15) and three lockwashers (16).

G With lifting hook (2) attached to door lifting lug (3), carefully lift door (1) from vehicle. Remove washer (17).

H Remove two hinge arms (18) from door (1) by removing from each, four screws (19), four lockwashers (20), eight flat washers (21) and four nuts (22).

I Pry up and remove two rubber seals (23) from seal channels of door (1).

J Use solvent (item 19, Appx D) and clean rags (item 50, Appx D) to thoroughly clean and dry door seal channel. Remove old seal particles.

INSTALLATION

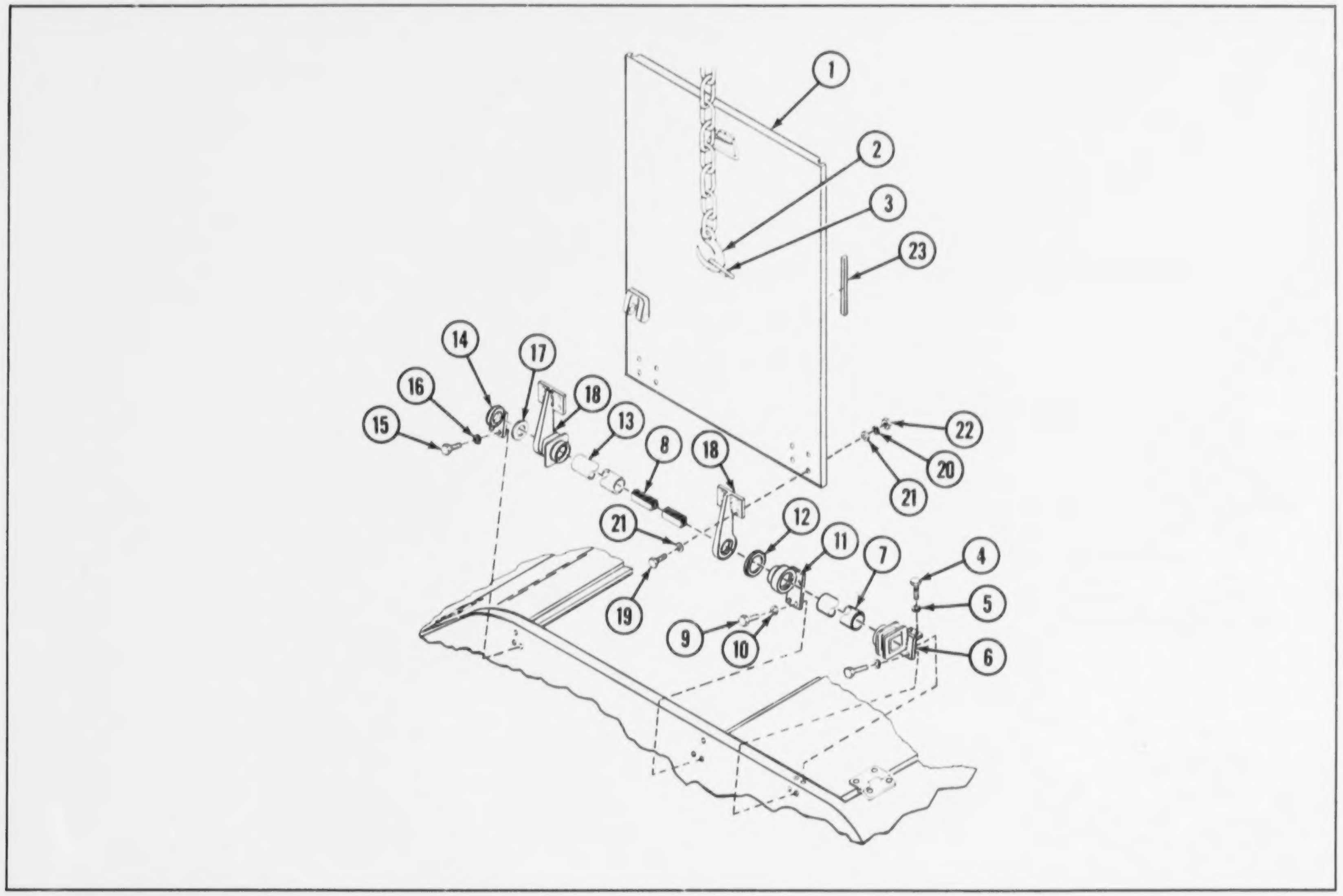
A Apply thin coating of adhesive (item 4, Appx D) to door seal channels and rubber seal (23). Allow adhesive to dry until tacky before seal installation. Position and install seal (23) with flat side toward seal channel and rounded side out.

B Apply zinc chromate paste (item 46, Appx D) between mounting surfaces of hinge arms (18) and door (1), and between mounting surfaces of anchors (6), hinges (11 and 15) and vehicle hull.

C Reverse removal procedures.

TA310040

TOP MIDDLE DOOR: REMOVAL AND INSTALLATION (CONTINUED)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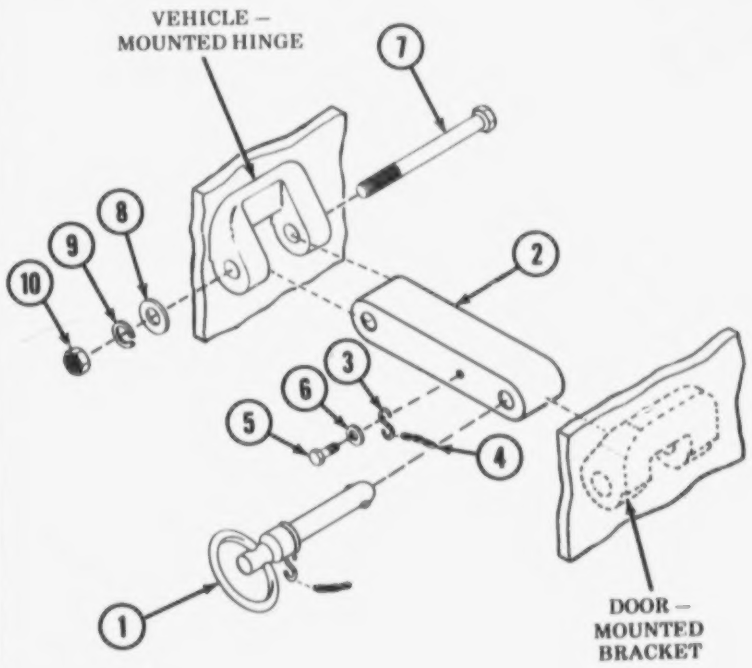
TA310041

TOP MIDDLE DOOR HOLD-OPEN COMPONENTS: REMOVAL AND INSTALLATION



REMOVAL

A If top middle door is being held open, remove quick-release pin (1) from door-mounted bracket and bar (2). Then close door.

B Remove S-hook (3) from quick-release pin (1).

C Remove chain with S-hook (4) from bar (2) by removing screw (5) and lockwasher (6).

D Remove bar (2) from vehicle-mounted hinge by removing screw (7), flat washer (8), lockwasher (9) and nut (10).

INSTALLATION

A Reverse removal procedures.

B To stow, place bar (2) into vehicle-mounted hinge and secure with quick-release pin (1).

TA310042

TOP MIDDLE DOOR: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

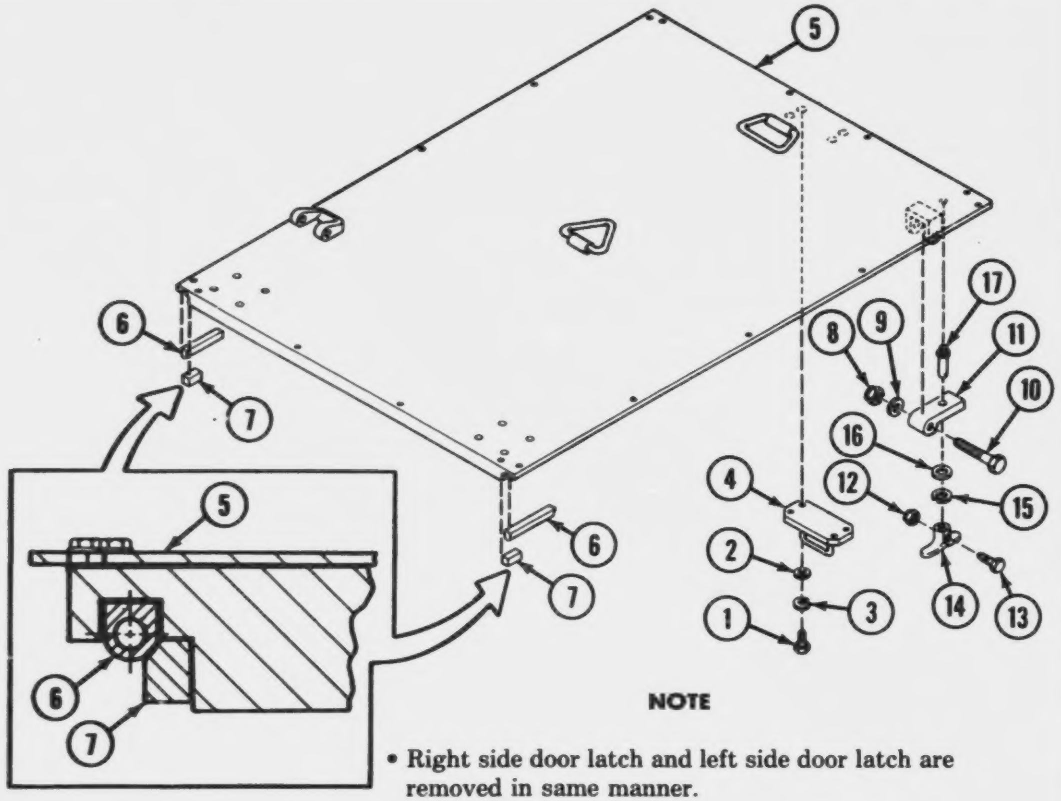
Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)
Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two

Equipment Condition:

Top middle door open and secured.
Outer seals and retainers removed (p 9-58.3).



DISASSEMBLY

A Remove four screws (1), four flat washers (2), four lockwashers (3) and bracket (4) from door (5). Discard lockwashers.

B Pry up and remove two rubber seals (6 and 7) from bottom left side channel and from bottom right side channel of door (5).

NOTE

- Right side door latch and left side door latch are removed in same manner.
- Note number of flat washers (16) removed to ensure proper installation.

C Remove nut (8), flat washer (9), screw (10) and latch (11) from door (5). Remove nut (12) and screw (13) releasing handle (14) lockwasher (15), flat washers (16) and stud (17) from latch (11). Discard lockwasher .

TA57262

TOP MIDDLE DOOR: DISASSEMBLY AND ASSEMBLY (CONTINUED)

ASSEMBLY

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

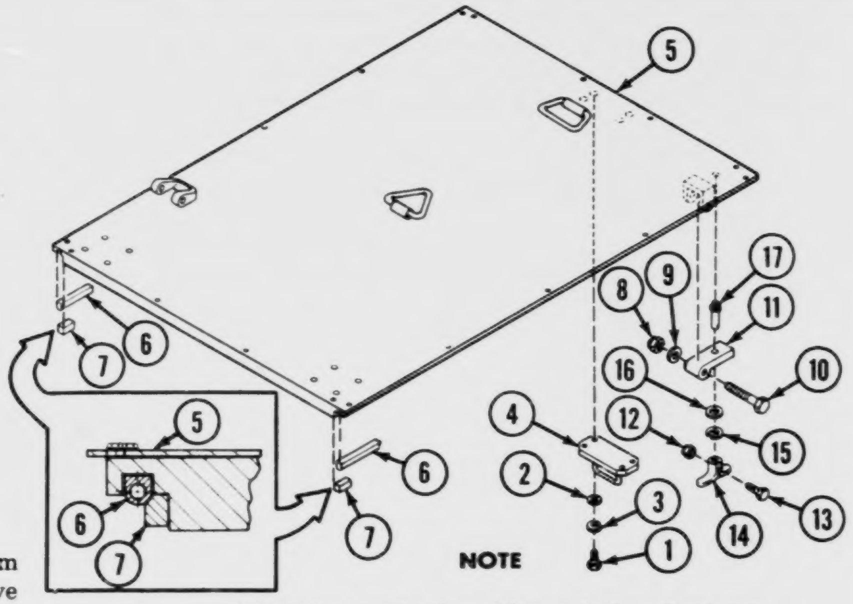
A Use dry-cleaning solvent (item 19, Appx D) and wire brush (item 48, Appx B) to thoroughly clean door seal channels. Remove all traces of old seals and adhesive.

B Apply thin coating of adhesive (item 4, Appx D) to door seal channels and to seals (6 and 7). Allow adhesive to dry until tacky before installing seals.

CAUTION

Be careful to avoid stretching or bunching seals. Sealing will be inadequate.

C Press seals (6 and 7) into firm contact with seal channels at left and right edges of door (5).



NOTE

Right side door latch and left side door latch are installed in same manner.

D Install stud)17) through latch (11). Place same number of flat washers)16) as removed, new lockwasher (15), and handle (14) on stud (17) and secure with screw (13) and nut (12).

E Install latch (11) on bracket on door (5) with screw (10), flat washer (9) and nut (8).

F Coat mating surfaces of bracket (4) and door (5) with zinc chromate paste (item 46, Appx D).

G Install bracket (4) on underside of door (5) with four screws (1), four flat washers (2) and four new lockwashers (3).

TA57263

TOP DOOR INNER SEALS: REMOVAL AND INSTALLATION

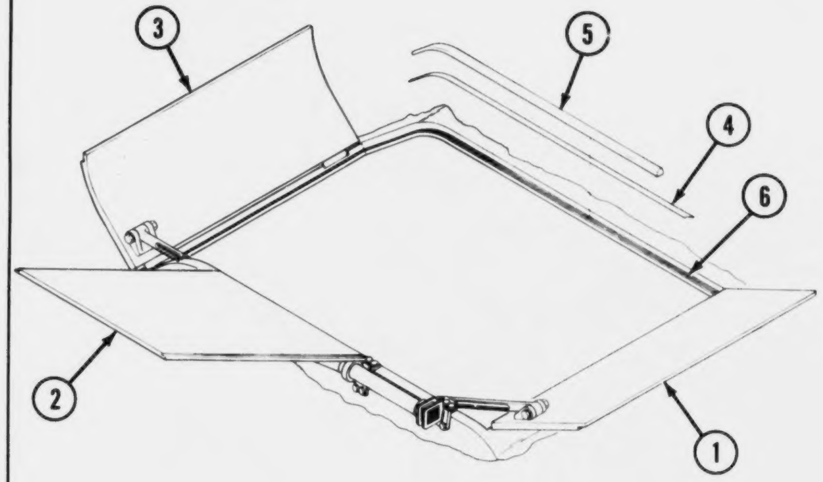
INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)



REMOVAL

A Open and secure top doors (1, 2 and 3).

B Pry up, remove and discard shim (4) and seal (5).

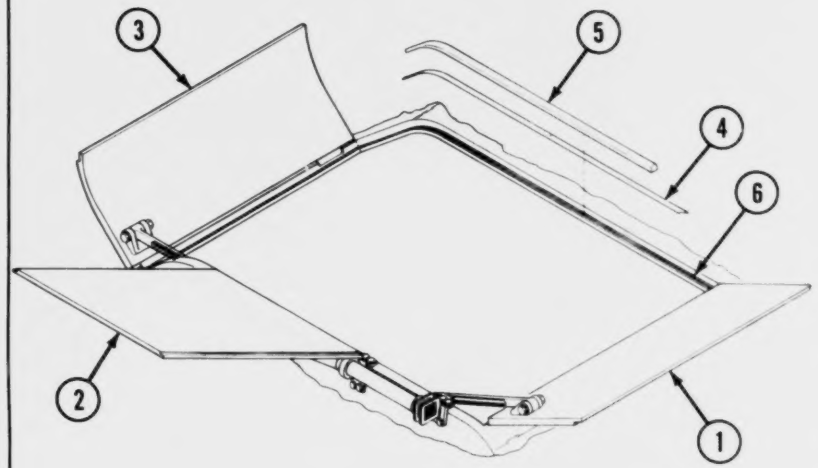
WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

C Use dry-cleaning solvent (item 19, Appx D) to clean and dry door seal channel thoroughly. Be sure to remove all old seal particles. Use wire brush (item 48 , Appx B) and rags, if necessary.

TA312963

TOP DOOR INNER SEALS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Apply thin coating of adhesive (item 4, Appx D) to mating surfaces of shim (4) and door seal channel (6). Allow adhesive to dry until tacky (about 5 minutes).

NOTE

To obtain maximum sealing results, avoid stretching or bunching new shim and seal.

B Position and install shim (4). Working with one end at center of door frame, move around door frame pressing shim in place until ends meet. Trim end if necessary for smooth tight fit.

C Apply light coat of adhesive (item 4, Appx D) to top side of shim (4). Allow adhesive to set for about 1 minute.

D Install seal (5) with round side facing doors. Start at front center of doorframe. Move around door frame as in step B.

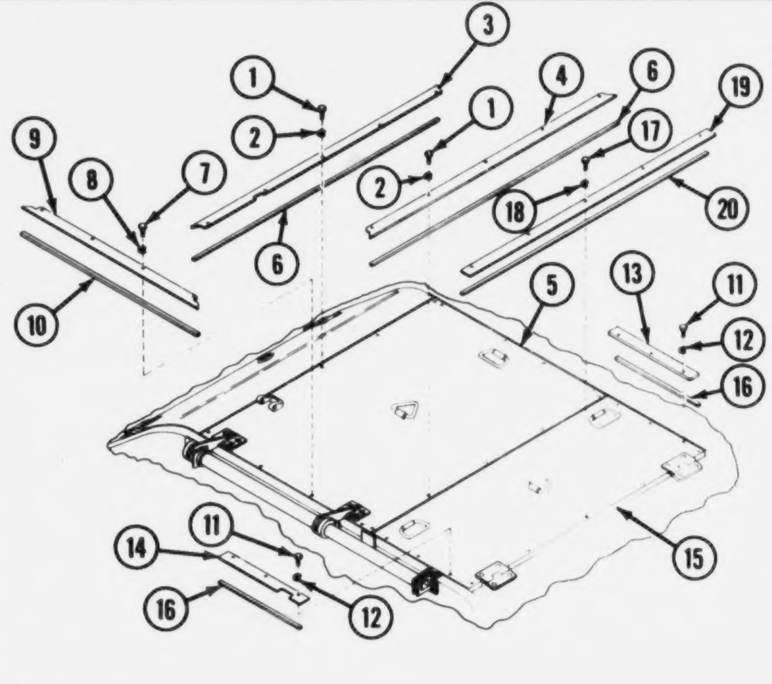
E Press seal (5) into firm contact. Start at front center of doorframe. Work away from center, along both sides at once toward ends of seal (5).

F Clean seal (5) with dry-cleaning solvent (item 19, Appx D). Any adhesive left on rounded surface will cause seal to stick to doors.

G Close and secure doors (1, 2 and 3). Allow adhesive to cure for about 30 minutes.

TA312964

TOP DOOR OUTER SEALS: REMOVAL AND INSTALLATION



REMOVAL

NOTE

Top right door has no outer seals.

A Remove five screws (1) and five lockwashers (2) from each seal retainer (3 and 4). Lift seal retainers (3 and 4) from sides of top middle door (5), releasing two seals (6). Discard lockwashers.

B Remove four screws (7) and four lockwashers (8) from each seal retainer (9). Lift two retainers (9) from ends of top middle door (5), releasing two seals (10). Discard lockwashers.

C Remove three screws (11) and three lockwashers (12) from each seal retainer (13 and 14). Lift seal retainers (13 and 14) from ends of top left door (15), releasing two seals (16). Discard lockwashers.

D Remove five screws (17) and five lockwashers (18) from seal retainer (19). Lift seal retainer (19) from left side of top left door (15), releasing seal (20). Discard lockwashers.

INSTALLATION

A Install seal (20) and seal retainer (19) at left edge of top left door (15) with five screws (17) and five new lockwashers (18).

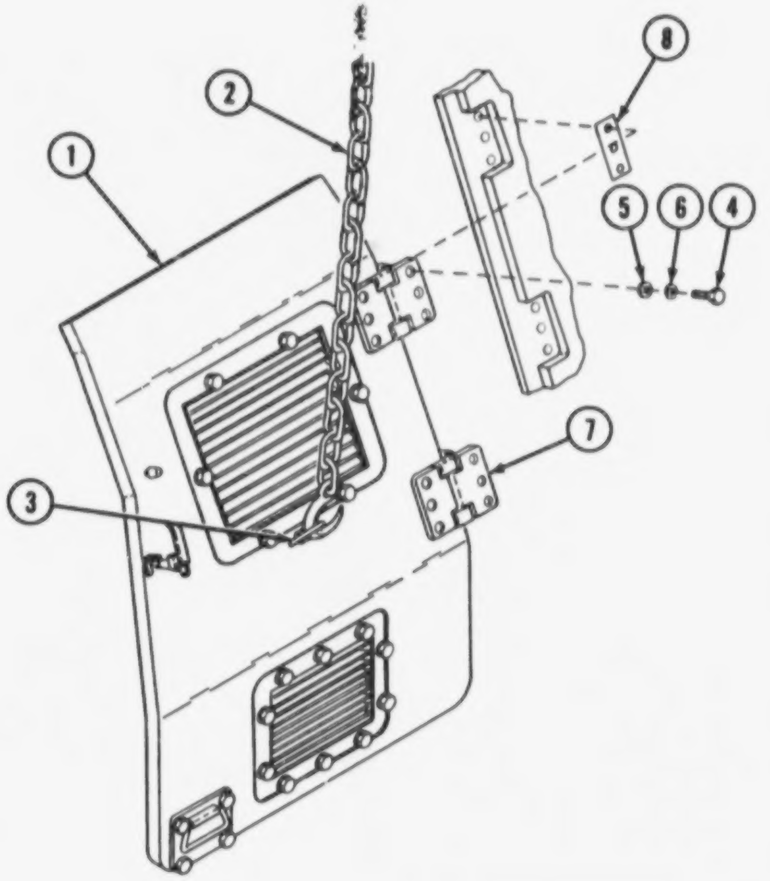
B Install two seals (16) and two seal retainers (13 and 14) at front and back edges of top left door (15) with three screws (11) and three new lockwashers (12) for each.

C Install two seals (10) and two seal retainers (9) at front and back edges of top middle door (5) with four screws (7) and four new lockwashers (8) for each.

D Install two seals (6) and two seal retainers (3 and 4) at left and right edges of top middle door (5) with five screws (1) and five new lockwashers (2) for each.

TA312965

APU COMPARTMENT SIDE DOOR: REMOVAL AND INSTALLATION



REMOVAL

A Close APU compartment side door (1).

B Secure suitable lifting device (2) to lifting eye (3).

CAUTION

Keep lifting cable taut while performing step C to prevent door from dropping out of place.

C Remove six hinge screws (4), six flat washers (5) and six lockwashers (6) that secure hinge assemblies (7) to side of vehicle.

D Remove any shims (8).

E Open APU door handle and lift APU compartment side door (1) free of vehicle, and remove lifting device (2) from lifting eye (3).

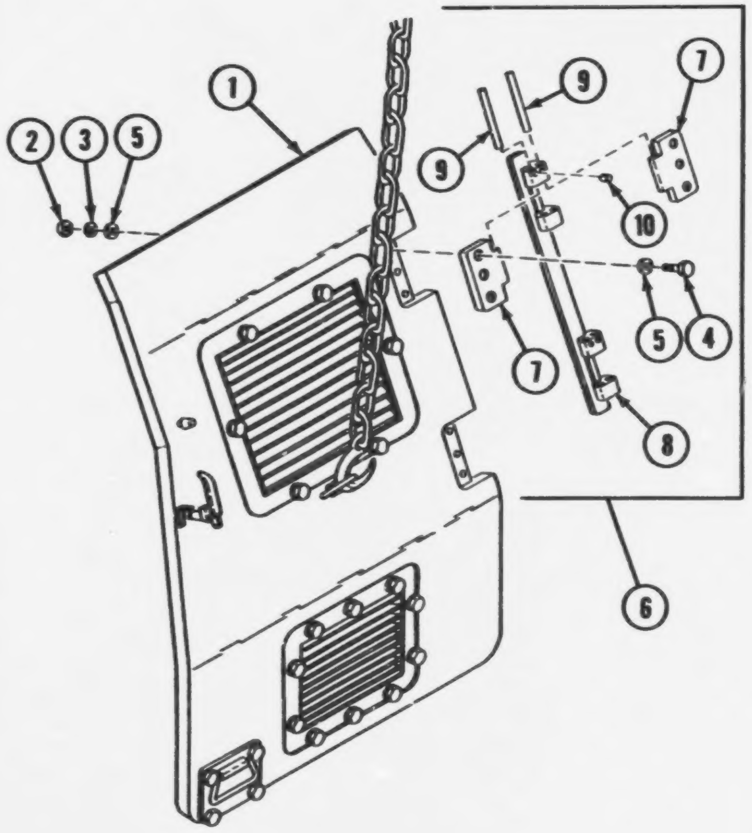
INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of hinge assemblies (7), vehicle door (1) and hull.

B Reverse removal procedures.

TA310045

APU COMPARTMENT DOOR HINGE: REMOVAL, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove APU compartment door (1) from vehicle.

B Remove six nuts (2), six lockwashers (3), six hinge screws (4) and 12 flat washers (5), and remove hinge (6) from APU compartment door (1).

ASSEMBLY

NOTE

If new hinge is to be installed, assemble pieces as follows.

A Install four hinge halves (7) on bar assembly (8) and drive four pins (9) through links of bar assembly and hinge halves. Make sure holes in pins (9) are positioned to aline with holes in links of bar assembly (8).

B Secure each of four pins (9) with spring pin (10).

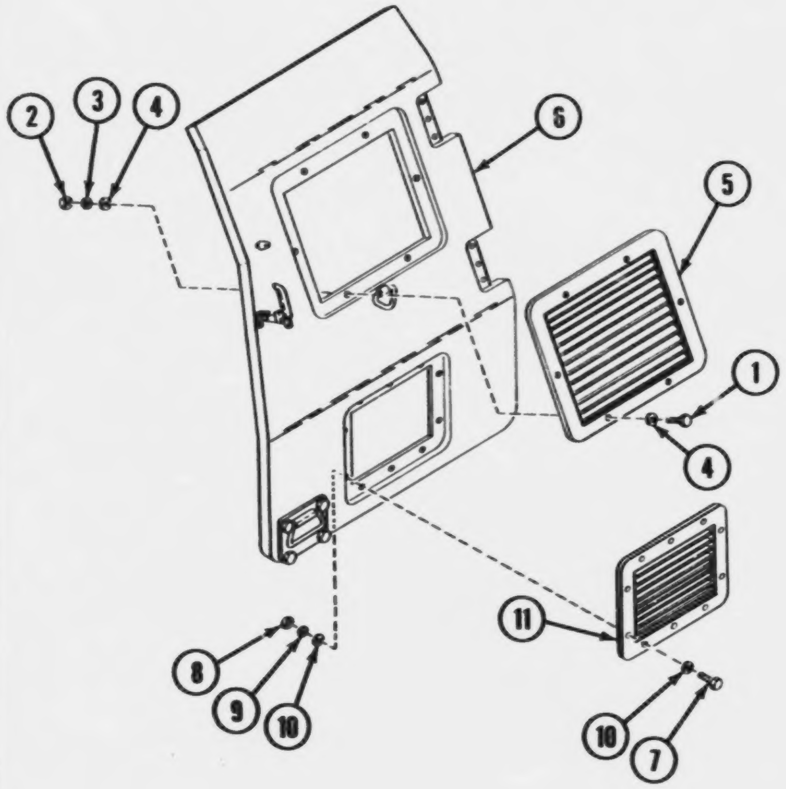
INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) to mating surfaces of hinge (6) and vehicle hull.

B Reverse removal procedures.

TA310046

APU COMPARTMENT UPPER AND LOWER LOUVERS: REMOVAL AND INSTALLATION



REMOVAL

A Remove six screws (1), six nuts (2), six lockwashers (3) and 12 flat washers (4) from upper louver (5) and remove louver from APU compartment door (6).

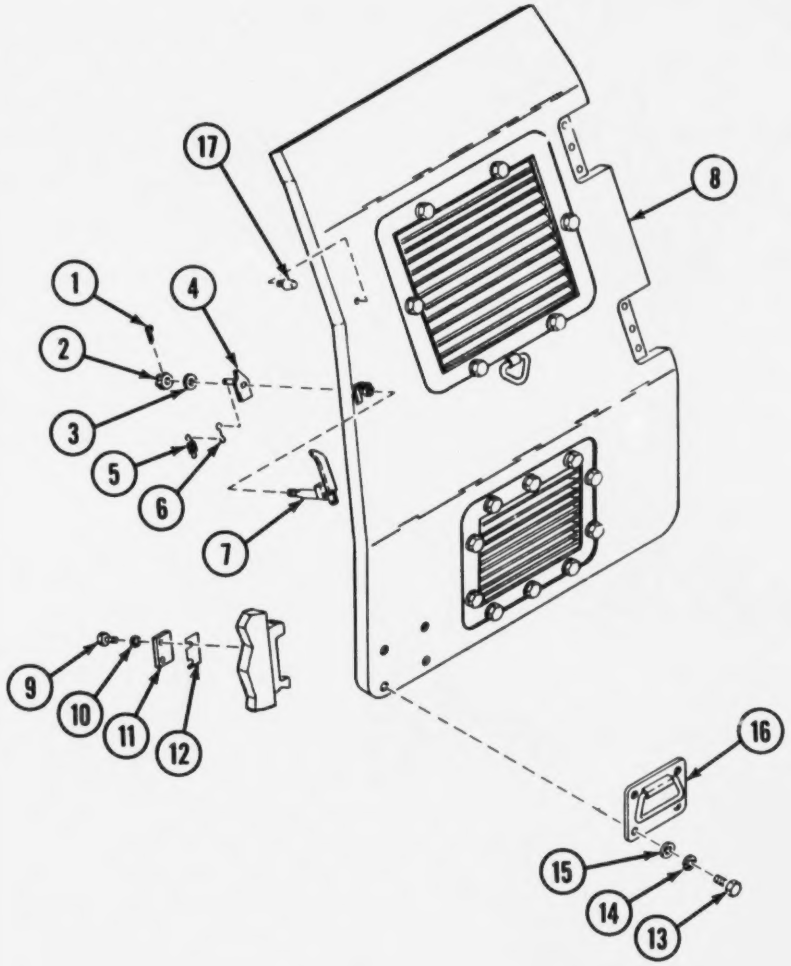
B Remove 10 screws (7), 10 nuts (8), 10 lockwashers (9) and 20 flat washers (10) from lower louver (11) and remove louver from APU compartment door (6).

INSTALLATION

A Reverse removal procedures.

TA310047

APU COMPARTMENT SIDE DOOR LATCH, STRIKE, BUMPER AND PULL HANDLE: REMOVAL AND INSTALLATION



REMOVAL

A Remove and discard cotter pin (1).

B Remove slotted nut (2), washer (3), latch (4), spring (5) and spring hook (6) and pull handle (7) from APU side door (8).

C Remove two screws (9), two lockwashers (10), strike (11) and shims (12) from inside APU compartment.

D Remove four screws (13), four lockwashers (14) and four flat washers (15), and pull handle (16) from APU side door (8).

E Turn out and remove bumper (17).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mounting surfaces of strike (11), pull handle (16) and vehicle hull.

B Reverse removal procedures.

TA310048

APU COMPARTMENT LOUVERED FRONT DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

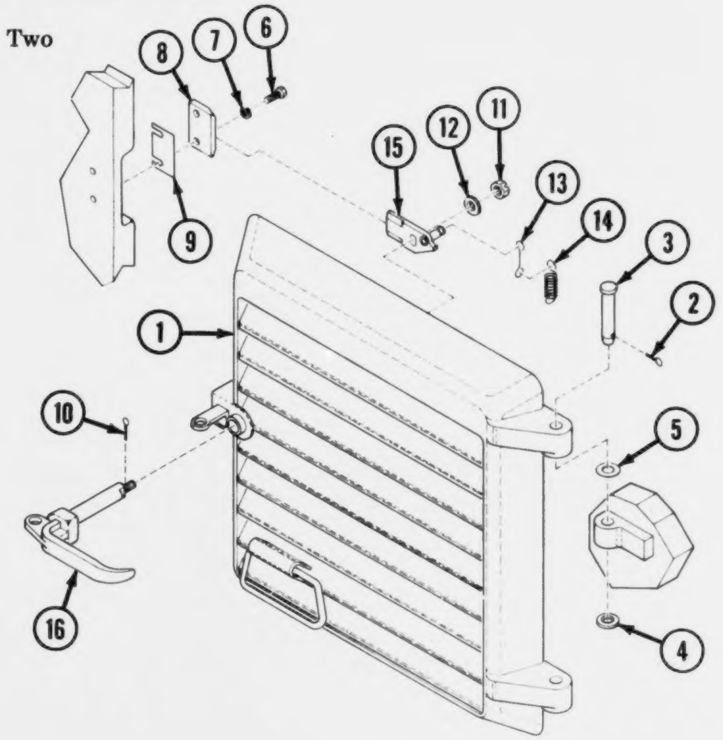
INITIAL SETUP

Materials/Parts:

Grease (item 32, Appx D)
Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two



TA312966

REMOVAL

A Open door (1).

B Have assistant support door (1). Remove two cotter pins (2), two headed pins (3), two flat washers (4) and two bronze bearing washers (5). Discard cotter pins.

C Remove door (1) from vehicle.

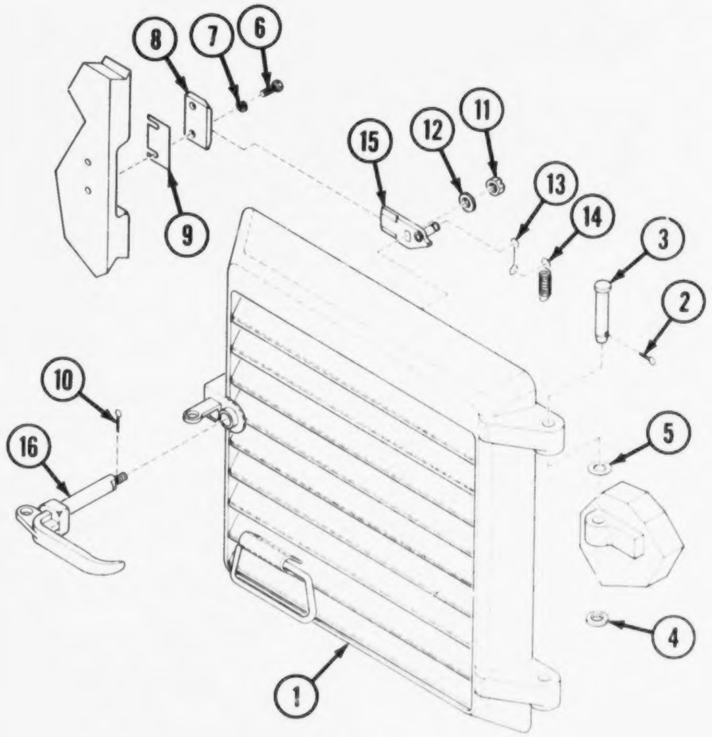
D Remove two screws (6), two lockwashers (7), strike (8) and shim (9) from inside APU compartment wall. Discard lockwashers.

DISASSEMBLY

A Remove cotter pin (10), slotted nut (11), flat washer (12), spring link (13), spring (14) and latch (15). Discard cotter pin.

B Pull handle (16) from door (1).

APU COMPARTMENT LOUVERED FRONT DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



ASSEMBLY

A Insert handle (16) in door (1).

B Install latch (15) on stud of handle (16) with flat washer (12), slotted nut (11) and new cotter pin (10).

C Turn handle (16) counterclockwise until latch (15) hits stop. Connect spring link (13) and spring (14) to latch (15) and to stud weldment on door.

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between strike (8), shim (9) and vehicle hull.

B Install strike (8) and shim (9) on inside of APU compartment with two screws (6) and two new lockwashers (7).

C Install door (1) on hull with bronze bearing washer (5) between each door hinge and its mating hinge boss on vehicle hull. Aline hinge pin holes.

D Apply thin coating of grease (item 32, Appx D) to two pins (3). Install two headed pins (3), two flat washers (4) and two new cotter pins (2).

E Close and secure door (1).

TA312967

FUEL FILL DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

REMOVAL

A Open fuel fill door (1).

B Remove nut (2), lockwasher (3) and flat washers (4). Support door (1) and remove hinge screw (5), flat washer (4) and two bronze bearing washers (6). Remove door (1). Discard lockwashers.

NOTE

Note position and number of flat washers to ensure proper installation.

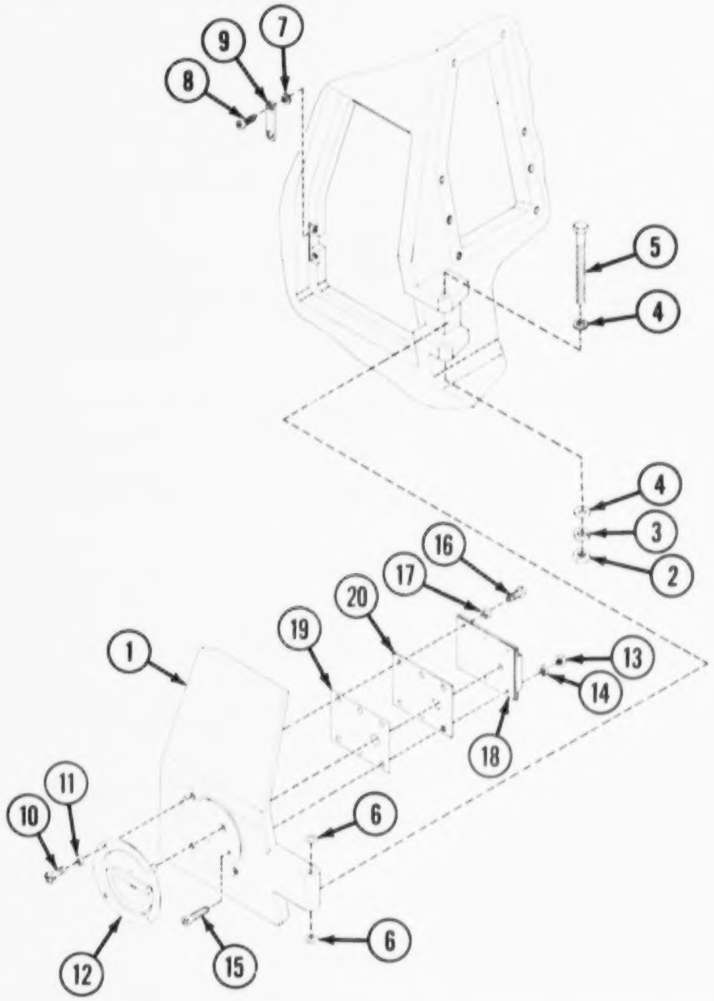
C Remove two screws (8), strike (9) and two flat washers (7), if used.

DISASSEMBLY

A Remove four screws (10) and four lockwashers (11), and pull handle (12) from door (1). Discard lockwashers.

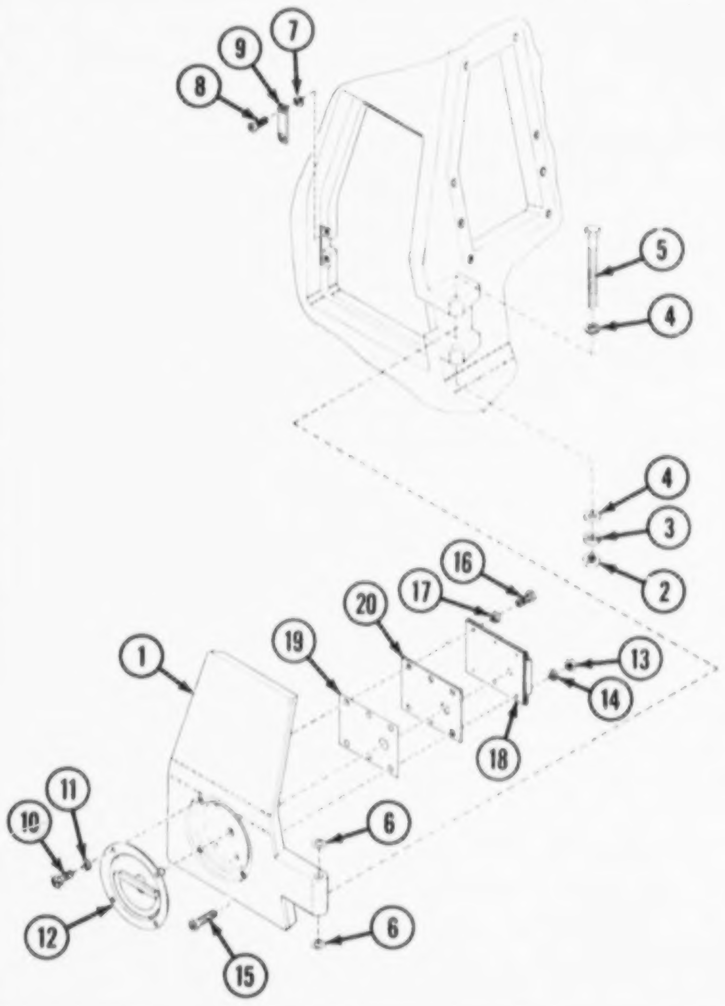
B Remove four nuts (13), four lockwashers (14) and four screws (15). Discard lockwashers.

C Remove two screws (16), two lockwashers (17), lock (18) and spacer plates (19 and 20) from door (1). Discard lockwashers.



TA312968

FUEL FILL DOOR: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Apply zinc chromate paste (item 46, Appx D) to mounting surface of handle (12) and spacer plate (19).

B Install spacer plates (19 and 20) and lock (18) with two screws (16) and two new lockwashers (17).

C Install four screws (15), four new lockwashers (14) and four nuts (13).

D Install handle (12) on door (1) with four screws (10) and four new lockwashers (11).

INSTALLATION

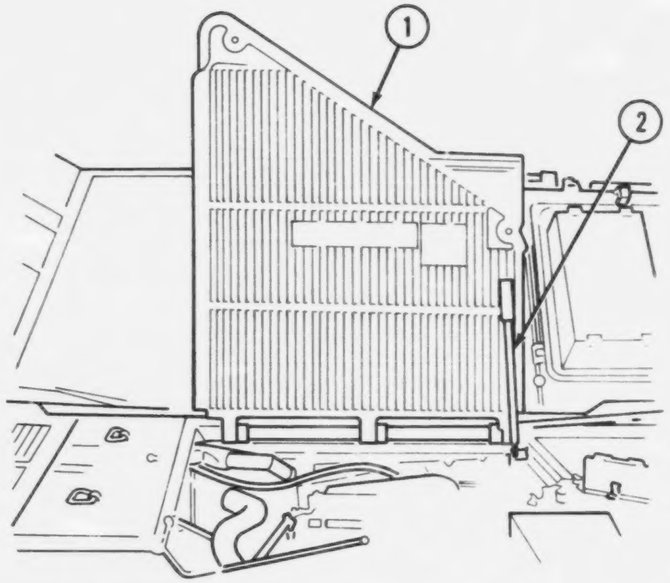
A Apply zinc chromate paste (item 46, Appx D) to mounting surface of strike (9) and flat washers (7), if used.

B Position hinge of door (1) between hinge bosses on hull. Place bronze bearing washer (6) above door hinge and bronze bearing washer (6) below door hinge. Insert flat washer (4) and hinge screw (5). Secure with flat washer (4), new lockwasher (3) and nut (2).

C Install strike (9) and flat washers (7), if used, with two screws (8).

TA312969

AIR INTAKE GRILLE: REMOVAL AND INSTALLATION



INITIAL SETUP

Test Equipment/Special Tools:

4 ft × 6 in. × 6 in. wooden supports.
Hex key socket, 3/8 in. (item 61, Appx B)

Personnel Required:

Two

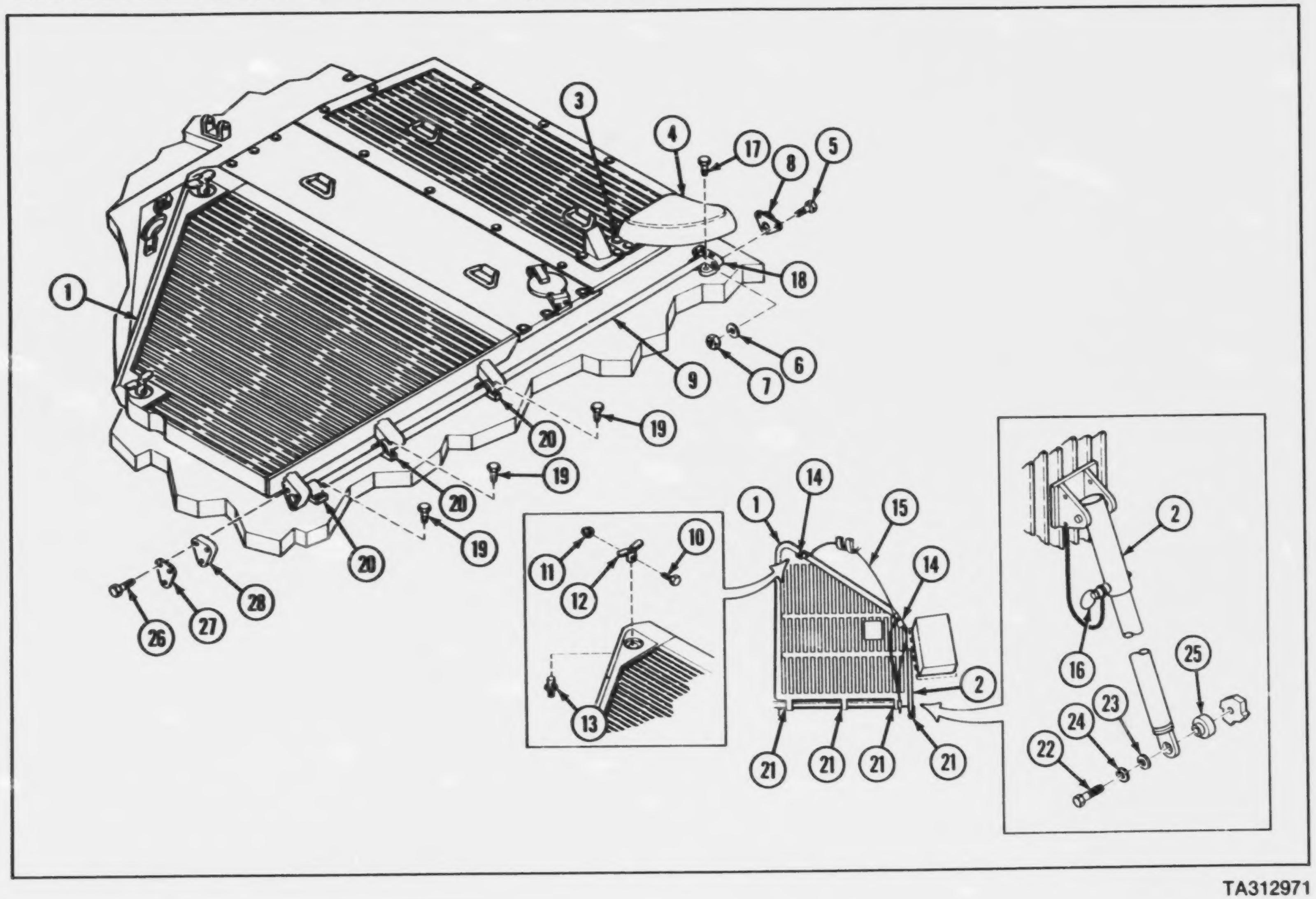
REMOVAL

WARNING
Open air intake grille to relieve tension on torsion bar and prevent injury to personnel.

A Open air intake grille (1) and secure with hold-open support (2).

TA312970

AIR INTAKE GRILLE: REMOVAL AND INSTALLATION (CONTINUED)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TA312971

AIR INTAKE GRILLE: REMOVAL AND INSTALLATION (CONTINUED)

CAUTION

Use caution when removing exhaust deflector to prevent damage to gasket.

B Remove four screws (3) and exhaust deflector (4).

C Remove two screws (5), two flat washers (6), two nuts (7) and anchor and shield (8) from right end of torsion bar (9).

D Remove two screws (10), two self-locking nuts (11), two handles (12) and two studs (13). Discard self-locking nuts.

E Install two eyebolts (14) in grille (1). Attach sling (15) and suitable lifting device. Take up slack in sling (15).

F Remove pin (16) from intake grille support (2) and lower air intake grille (1).

G Remove torsion bar (9) from right side of vehicle.

H Remove four hex key screws (17) from right end cap (18).

I Remove four hex key screws (19) from rear of torsion bar clamps (20).

J Open air intake grille (1) and maintain tension with lifting device.

K Remove four hex key screws (21) from front of torsion bar tube clamps (20).

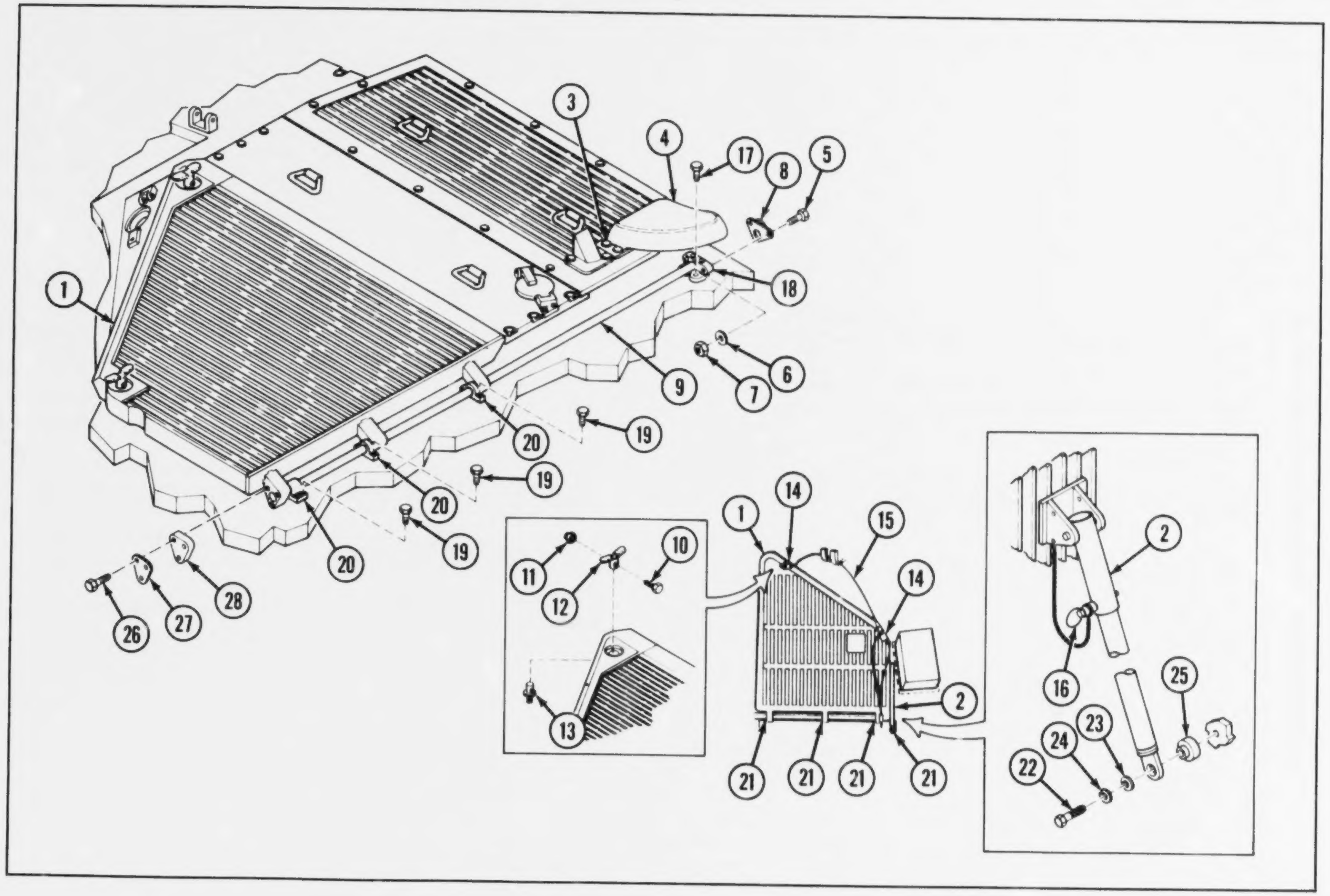
L Remove screw (22), flat washer (23) and lockwasher (24). Remove bearing (25) from end of intake grille support (2). Discard lockwasher.

M Lift air intake grille (1) off vehicle and position on 6" × 6" timbers. Remove two eyebolts (14).

N Remove three screws (26), shield (27) and adapter (28) from left end of torsion bar (9).

TA312972

AIR INTAKE GRILLE: REMOVAL AND INSTALLATION (CONTINUED)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TA312973

AIR INTAKE GRILLE: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Install two eyebolts (14) in grille (1). Attach sling (15) and a suitable lifting device. Lift grille (1) into position and aline mounting holes.

B Install four hex key screws (21) in front of torsion bar tube clamps (20).

C Insert bearing (25) in end of intake grille support (2). Secure bearing (25) and support (2) with screw (22), flat washer (23) and new lockwasher (24).

D Lower air intake grille (1).

E Install four hex key screws (19) in rear of torsion bar tube clamps (20).

F Install four hex key screws (17) in right end cap (18).

NOTE

Install torsion bar with grille at 90- to 95-degree open position, in no-load condition.

G Raise air intake grille (1) and insert torsion bar (9) from right side of vehicle.

H Position shield (27) and adapter (28) at left end of torsion bar (9) and secure with three screws (26).

I Install shield and anchor (8) at right end of torsion bar (9) with two screws (5), two flat washers (6) and two nuts (7).

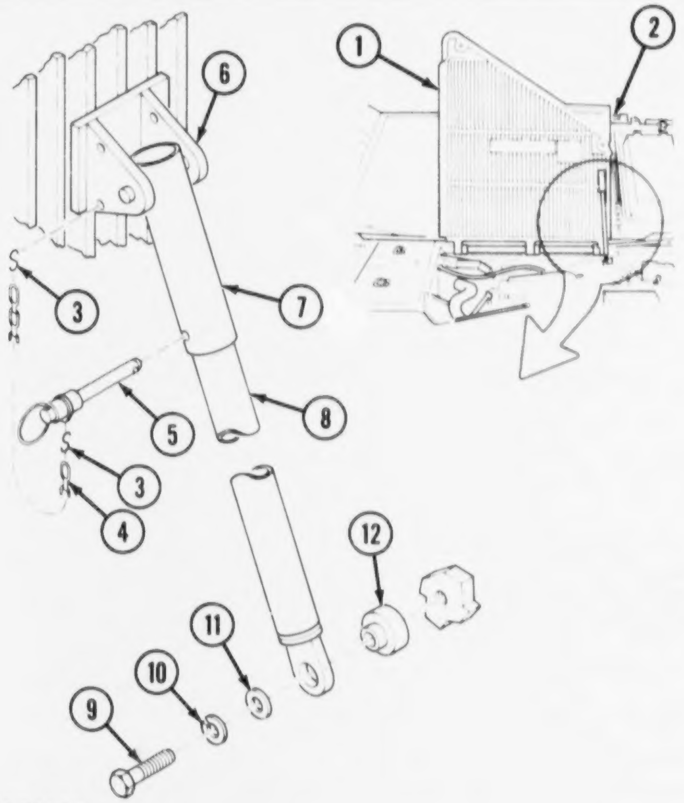
J Install exhaust deflector (4) with four screws (3).

K Lower air intake grille (1) to closed position. Disconnect lifting device and sling (15). Remove eyebolts (14).

L Insert two studs (13) from bottom side of grille (1). Install two handles (12) with two screws (10) and two new self-locking nuts (11).

TA312974

AIR INTAKE GRILLE SUPPORT: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Failure to secure air intake grille may result in serous personnel injury.

A Open air intake grille (1). Secure to top center door torsion bar housing (2) with rope or strap.

B Disconnect two S-hooks (3) and remove chain (4) from quick-release pin (5) and grille (1).

NOTE

Sleeve mount and sleeve are inseparable parts of air intake grille.

C Remove quick-release pin (5) from stowage hole in sleeve mount (6), or from deploy hole at bottom end of sleeve (7).

D Release support (8) from hull by removing screw (9), lockwasher (10), washer (11) and bearing (12). Discard lockwasher.

E Slide support (8) out of sleeve (7).

INSTALLATION

A Slide support (8) into sleeve (7). Secure bottom end of support (8) to hull with screw (9), new lockwasher (10), washer (11) and bearing (12).

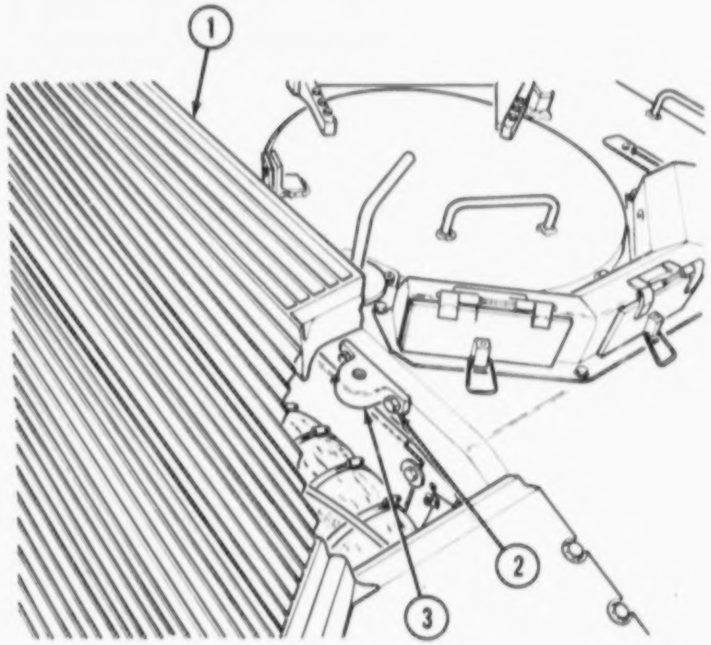
B Insert quick-release pin (5) into deploy hole at bottom of sleeve (7) or into stowage hole in sleeve mount (6).

C Remove rope or strap securing air intake grille (1) to top center door torsion bar housing (2).

D Close and secure air intake grille (1).

TA312975

INTAKE GRILLE ATTACHING BRACKET: REMOVAL AND INSTALLATION



INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

REMOVAL

A Open and secure air intake grille (1).

B Remove two screws (2) and attaching bracket (3).

INSTALLATION

A Apply thin coating of zinc chromate paste (item 46, Appx D) on mating surfaces of hull and attaching bracket (3).

B Install attaching bracket (3) on hull with two screws (2).

C Close and secure air intake grille (1).

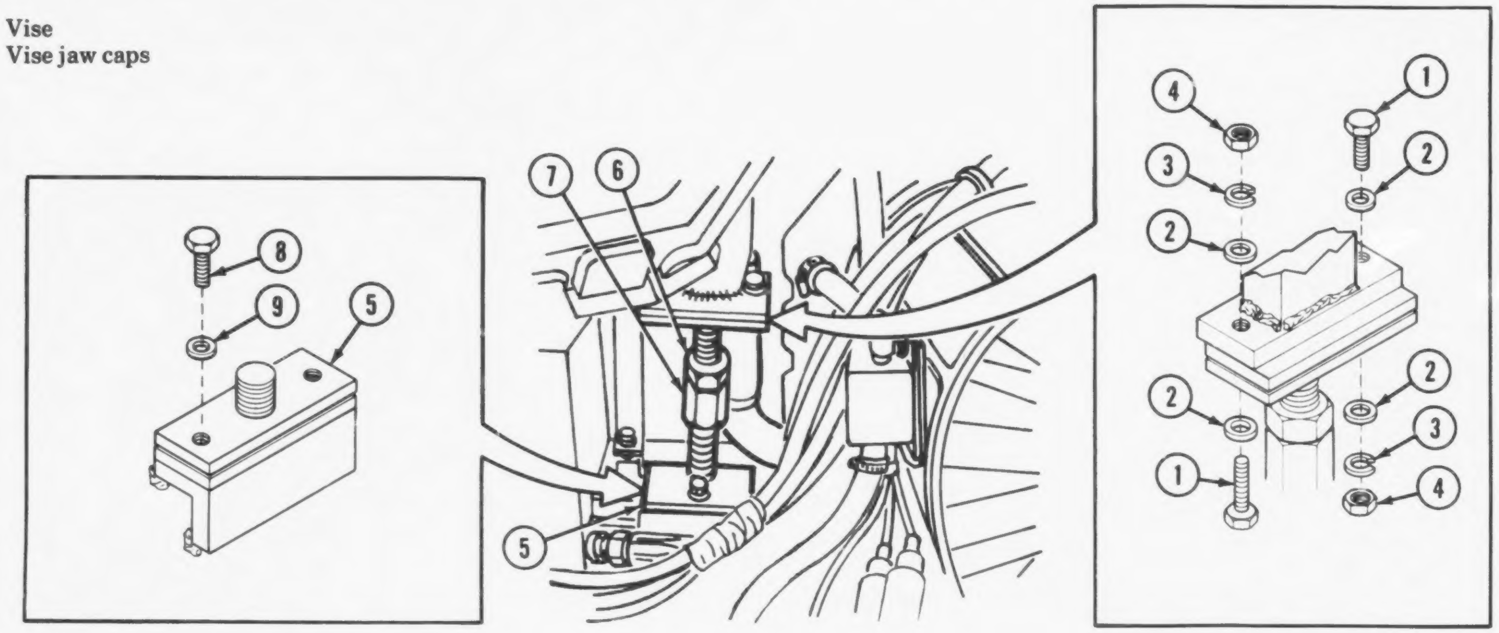
TA312976

GRILLE ADJUSTABLE SUPPORT ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools

Vise
Vise jaw caps



REMOVAL

A Open and secure right transmission access door.

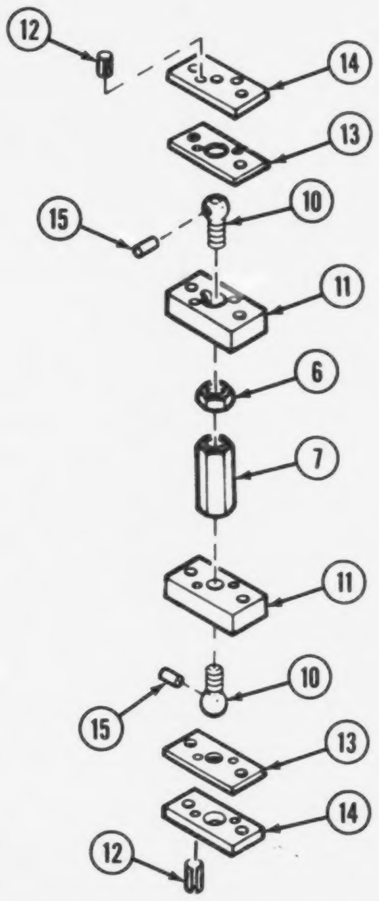
B Remove two screws (1), four flat washers (2), two lockwashers (3) and two nuts (4) from grille adjustable support assembly (5). Discard lockwashers.

C Loosen jamnut (6) and turn grille support adjustment bar (7) counterclockwise to relieve load on adjustable support assembly (5).

D Remove two screws (8), two flat washers (9) and remove adjustable support assembly (5) from vehicle.

TA312977

GRILLE ADJUSTABLE SUPPORT ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Unscrew jamnut (6) and grille support adjustment bar (7) fully, to disengage adjustable screws (10). Remove jamnut (6) and adjustment bar (7). Separate adjustable screws (10) and mounting plates (11) with attached parts.

B Clamp mounting plate (11) in vise. Drive out and discard two spring pins (12), releasing plate (11), shim (13) and plate (14).

C Lift ball portion of adjustable screw (10) from plate (11).

D Pull pin (15) from ball portion of adjustable screw (10).

ASSEMBLY

A Install pin (15) in ball portion of adjustable screw (10).

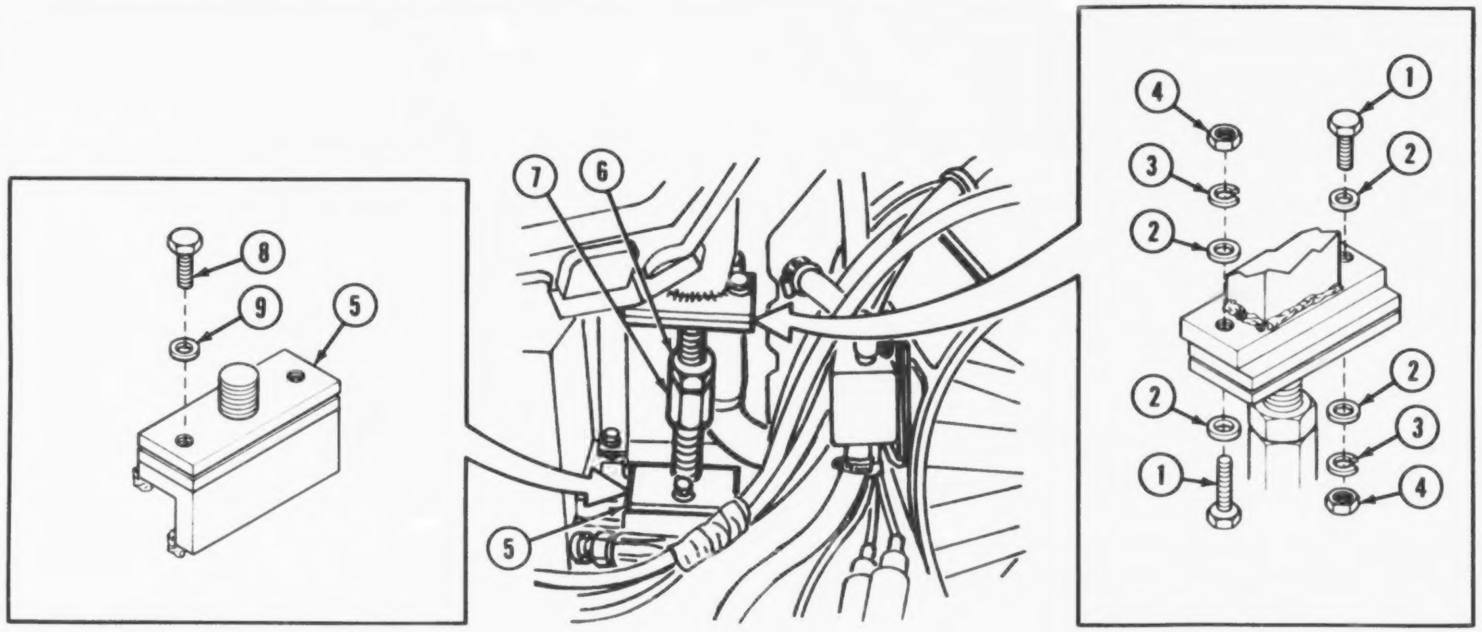
B Install ball portion of adjustable screw (10) in plate (11).

C Connect plate (14), shim (13) and plate (11) with two spring pins (12).

D Install jamnut (6) and adjustment bar (7) on adjustable screws (10). Tighten jamnut (6).

TA312978

GRILLE ADJUSTABLE SUPPORT ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Position grille adjustable support assembly (5) between upper mount on underside of grille support plate, and lower mount on hull. Aline mounting holes.

B Secure lower end of grille adjustable support assembly (5) with two screws (8) and two flat washers (9).

C Secure upper end of grille adjustable support assembly (5) with two screws (1), four flat washers (2), two new lockwashers (3) and two nuts (4).

D Adjust height of grille adjustable support assembly (5) to support weight of grille if necessary. Raise by turning grille support adjustment bar (7) clockwise. Tighten jamnut (6).

E Close and secure right transmission access door.

TA312979

FAN ACCESS DOOR: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

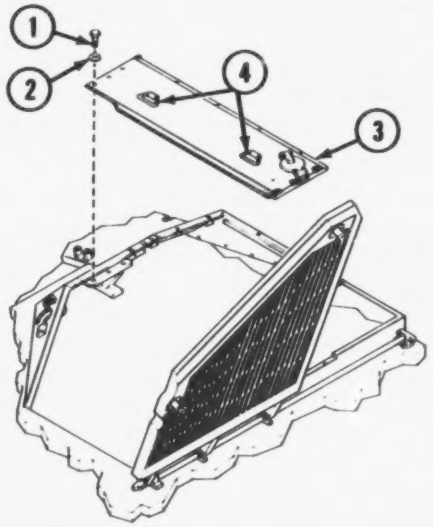
Sling, nylon (item 58, Appx B)

Personnel Required:

Two

Equipment Condition:

Exhaust deflectors removed (p 9-66.13).
Exhaust deck removed (p 9-66.12).



REMOVAL

A Open and secure intake grille.

WARNING

Before disconnecting AFES sensors, read page 14-14.1. Thoroughly understand how to deactivate the fire suppression system. Accidental discharge can cause serious injury.

B Disconnect fire sensing element couplings (p 14-15).

NOTE

Make sure plastic caps are secure to protect opened couplings from dirt and moisture.

C Remove six screws (1) and six flat washers (2) releasing fan access door (3).

CAUTION

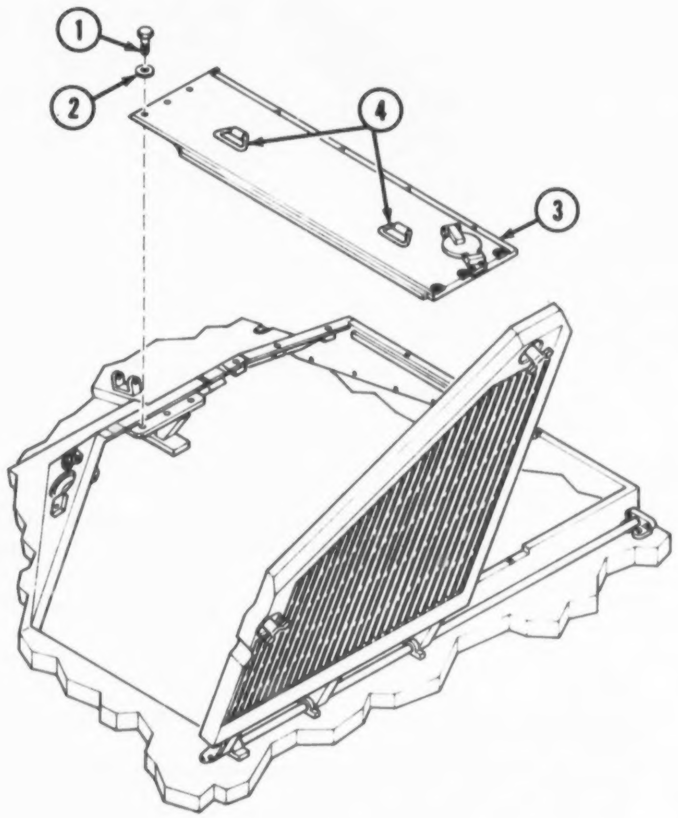
When setting door on bench or other work surface, make sure weight does not fall on fire sensor components, causing damage.

D Install suitable lifting device and sling to lifting handles (4). Lift fan access door (3) from vehicle to a suitable work area.

E Remove fire sensing element, as necessary (p 14-15).

TA312980

FAN ACCESS DOOR: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install fire sensing element on fan access door as necessary (p 14-15).

B Install suitable lifting device and sling on lifting handles (4). Raise door (3) into position on vehicle and secure with six screws (1) and six flat washers (2).

C Connect fire sensing element couplings (p 14-15).

D Close and secure intake grille.

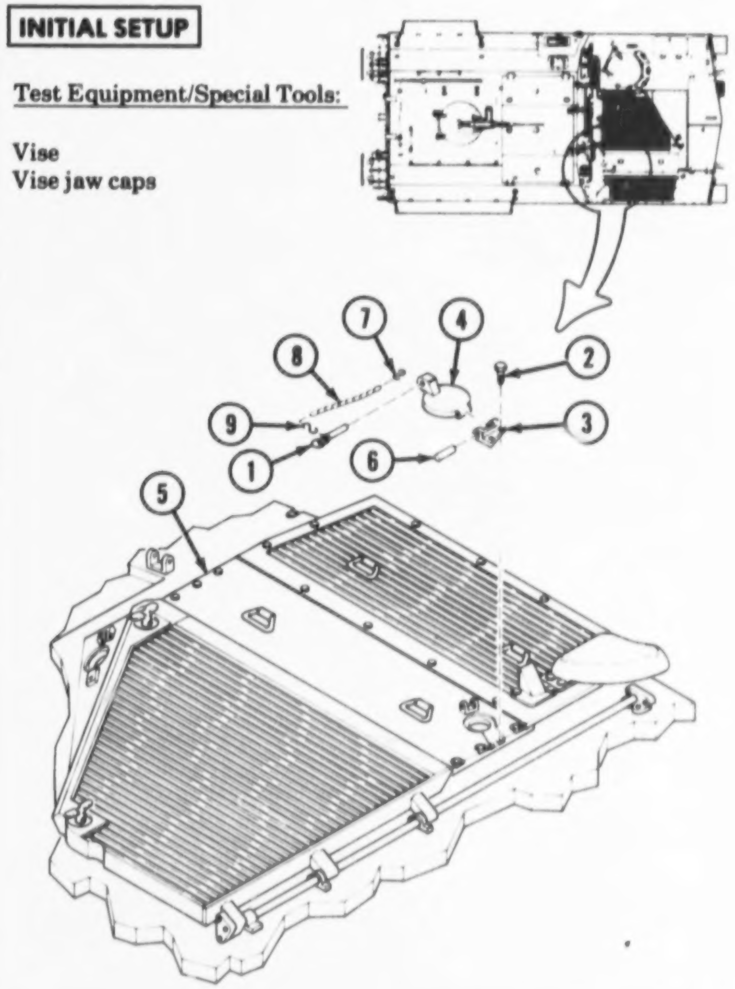
TA312981

RADIATOR CAP ACCESS COVER: REMOVAL,DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Vise
Vise jaw caps



REMOVAL

A Remove quick-release pin (1).

B Remove two screws (2) releasing hinge latch (3) and radiator cap access cover (4) from fan access door (5).

DISASSEMBLY

A Place cover (4) in capped vise. Drive out spring pin (6), releasing access cover (4) from hinge latch (3). Discard spring pin.

B Remove S-hook (7) from welded eyelet on access cover (4) and from chain (8).

C Remove S-hook (9) from quick-release pin (1) and chain (8).

ASSEMBLY

A Install access cover (4) in hinge latch (3) with new spring pin (6).

B Connect chain (8) to quick-release pin (1) and to welded eyelet of access cover (4) with S-hooks (7 and 9).

C Remove cover (4) from capped vise.

INSTALLATION

A Install hinge latch (3) on fan access door (5) with two screws (2).

B Close access cover (4). Secure with quick-release pin (1).

TA312982

EXHAUST DECK: REMOVAL AND INSTALLATION

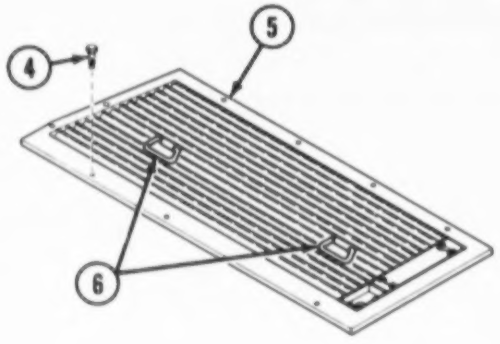
INITIAL SETUP

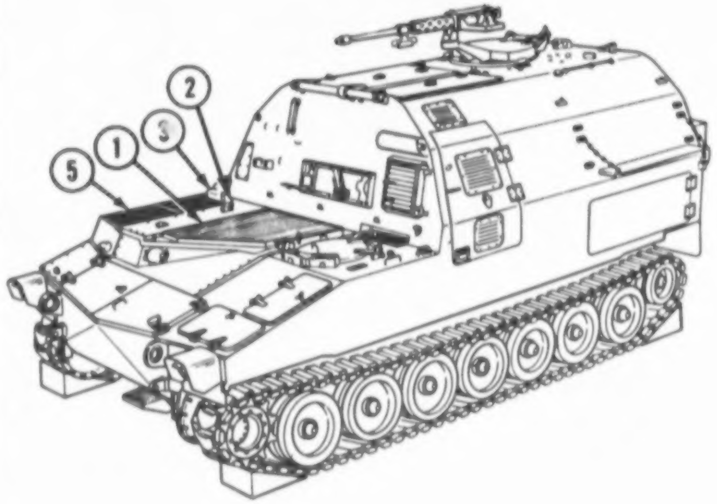
Test Equipment/Special Tools:

Sling, nylon (item 58, Appx B)

Personnel Required:

Two





REMOVAL

A Open and secure intake grille (1).

B Remove exhaust deflectors (2 and 3) (p 9-66.13).

C Remove 14 screws (4) releasing exhaust deck (5).

D Install suitable lifting device and sling on exhaust deck lifting handles (6). Remove exhaust deck (5) from vehicle.

INSTALLATION

A Install suitable lifting device and sling on exhaust deck lifting handles (6).

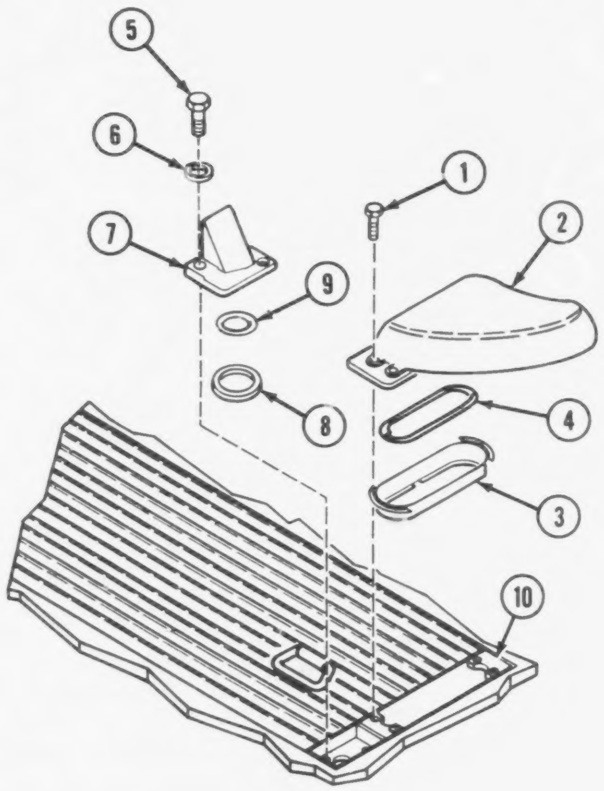
B Lift exhaust deck (5) into position and secure with 14 screws (4).

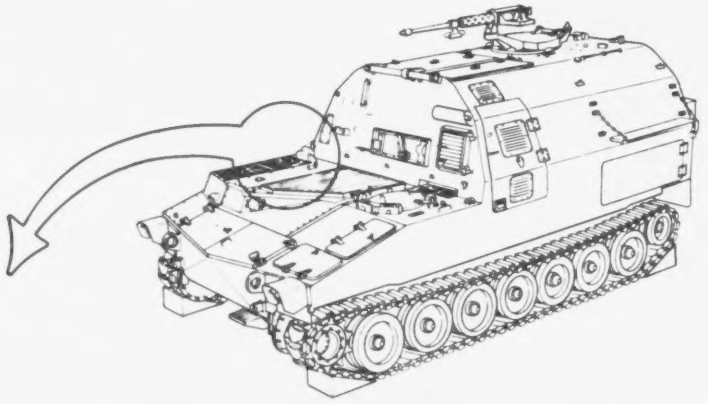
C Install exhaust deflectors (2 and 3) on exhaust deck (5) (p 9-66.13).

D Close and secure intake grille.

TA312983

EXHAUST DEFLECTORS: REMOVAL AND INSTALLATION





REMOVAL

A Remove four screws (1), engine exhaust deflector (2), seal support (3) and packing (4). Discard packing.

B Remove two screws (5), two flat washers (6), personnel heater exhaust deflector (7), spring washer (8) and preformed packing (9). Discard packing.

INSTALLATION

A Position new preformed packing (9) around personnel heater exhaust pipe. Retain with spring washer (8).

B Install personnel heater exhaust deflector (7) with two screws (5) and two flat washers (6).

C Install seal support (3) and new packing (4) over exhaust pipe and in exhaust deck (10).

D Install engine exhaust deflector (2) with four screws (1).

TA312984

TRANSMISSION ACCESS DOORS: REMOVAL AND INSTALLATION

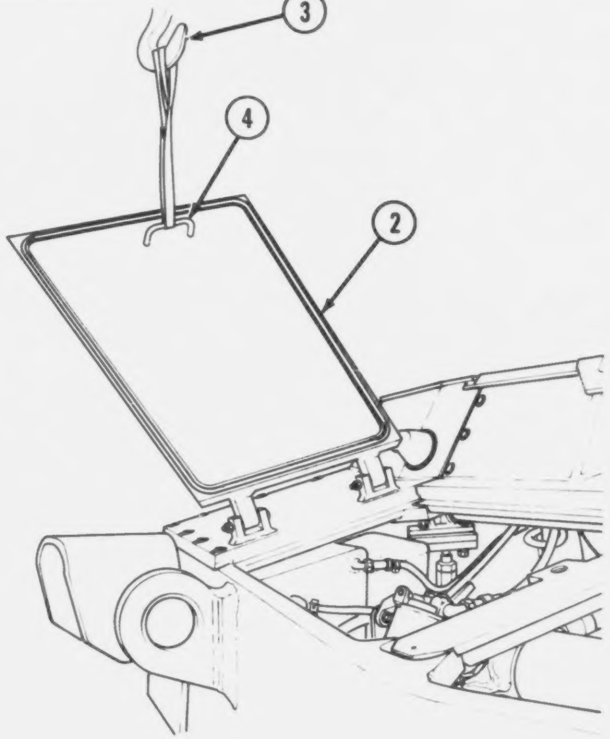
INITIAL SETUP

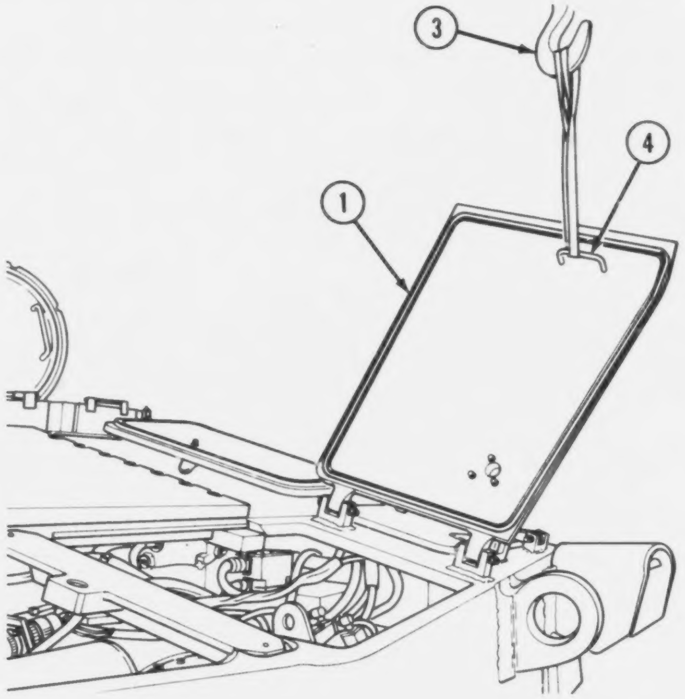
Test Equipment/Special Tools:

Sling, nylon (item 58, Appx B)

Personnel Required:

Two





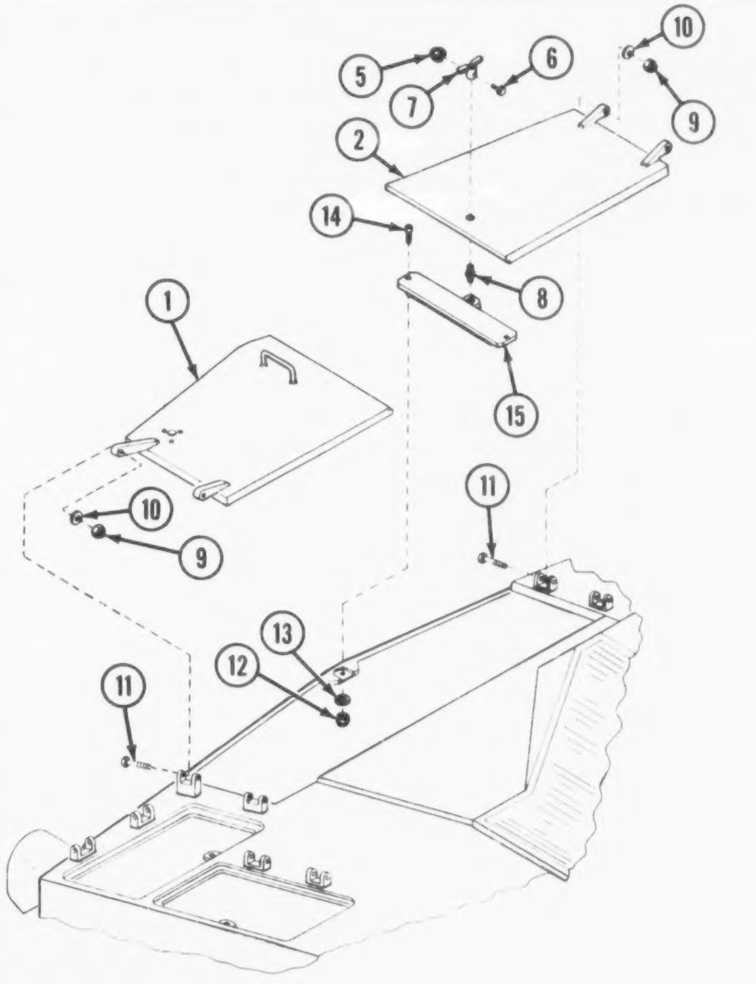
REMOVAL

A Open left or right transmission access door (1 or 2).

B Attach hook (3) of suitable lifting device to nylon sling wrapped around handle (4) of either door (1 or 2). Lift door (1 or 2) to upright position.

TA312985

TRANSMISSION ACCESS DOORS: REMOVAL AND INSTALLATION (CONTINUED)



NOTE

Door handle of right door is similar to door handle for battery access doors (p 9-66.4). This step applies to both handles.

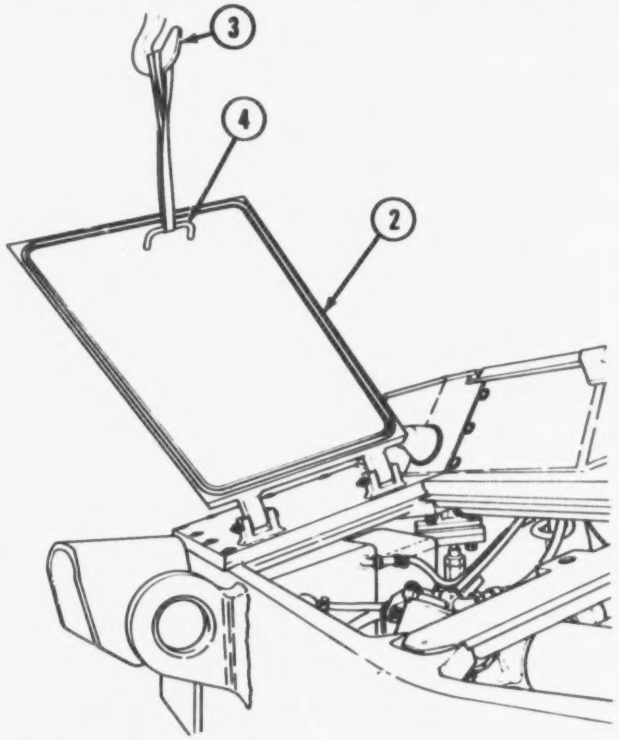
C Remove self-locking nut (5) and screw (6) releasing handle (7) and handle stud (8). Discard self-locking nut.

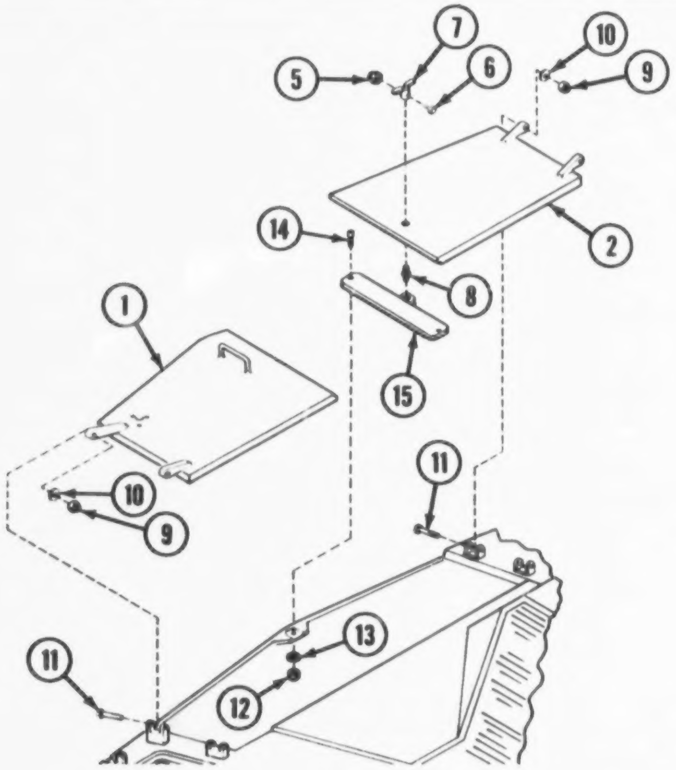
D Remove two self-locking nuts (9), two flat washers (10) and two screws (11) from hinges of either door (1 or 2). Discard self-locking nuts. Lift door from vehicle.

E Remove two self-locking nuts (12), two flat washers (13) and two screws (14) releasing door bracket (15) from hull. Discard self-locking nuts.

TA312986

TRANSMISSION ACCESS DOORS: REMOVAL AND INSTALLATION (CONTINUED)





INSTALLATION

A Install door bracket (15) on hull with two screws (14), two flat washers (13) and two new self-locking nuts (12).

B Attach hook (3) of suitable lifting device to nylon sling wrapped around handle (4) of either door (1 or 2). Lift door into position on hull and install two screws (11), two flat washers (10) and two new self-locking nuts (9).

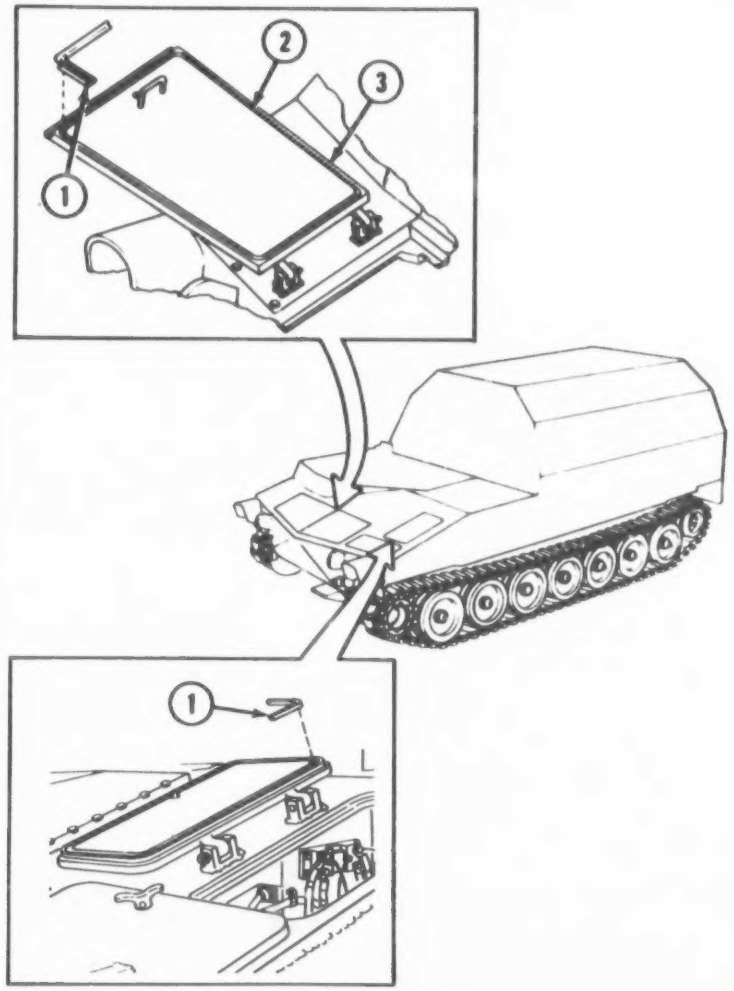
C Insert stud (8) through door (2). Install handle (7) on stud (8) with screw (6) and new self-locking nut (5).

D Remove nylon sling from door (1 or 2).

E Close and secure transmission access door (1 or 2).

TA312987

TRANSMISSION ACCESS DOORS' AND BATTERY ACCESS DOORS' SEALS: REMOVAL AND INSTALLATION



INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Material/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)

REMOVAL

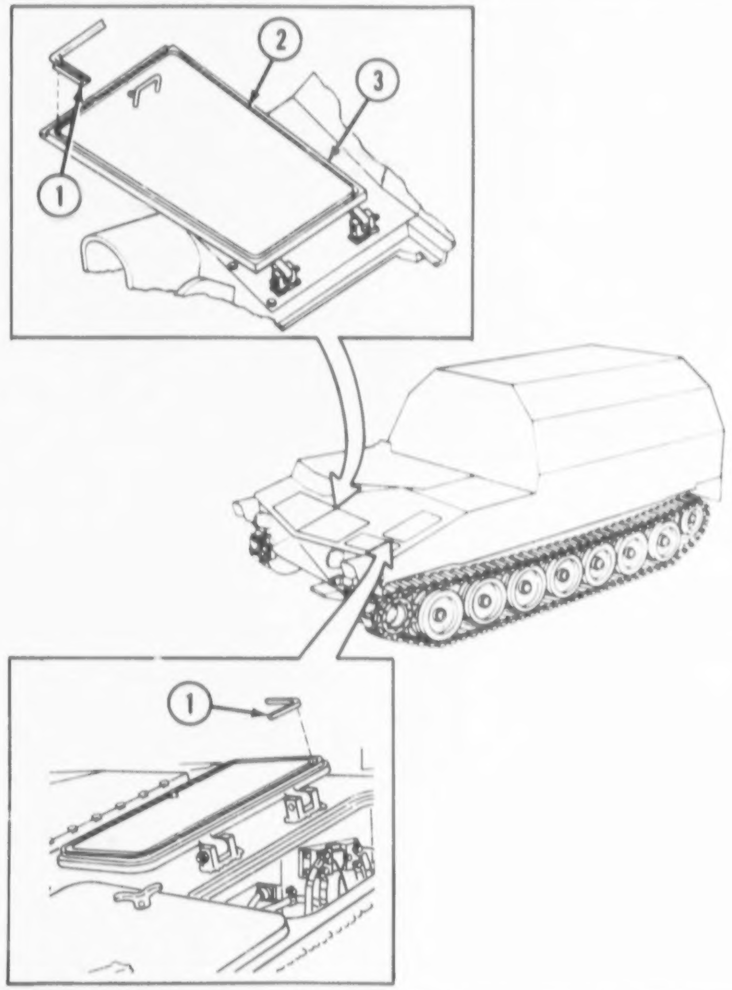
A Open appropriate door.

> **WARNING**
>
> Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

B Scrape seal (1) from seal channel (2) on underside of door (3). Use dry-cleaning solvent (item 19, Appx D) and wire brush (item 48, Appx B), as necessary. Remove all debris from seal channel (2).

TA312988

TRANSMISSION ACCESS DOORS' AND BATTERY ACCESS DOORS' SEALS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Make sure seal channel (2) is clean and dry. Apply light coat of adhesive (item 4, Appx D) to flat side of seal (1) and deepest part of seal channel (2). Allow to dry (5 minutes) until tacky.

B Insert seal (1) in channel at middle of hinge edge of door. Lip of seal must face hinges. Press seal into place working around door channel (2) until ends meet. Do not stretch or bunch seal. Trim end of seal (1) if necessary to make tight, smooth joint.

C Clean all adhesive from face of seal (1) using dry-cleaning solvent (item 19, Appx D).

D Close and latch appropriate door. Allow adhesive to cure about 30 minutes.

TA312989 ■

BATTERY ACCESS DOORS: REMOVAL AND INSTALLATION

INITIAL SETUP

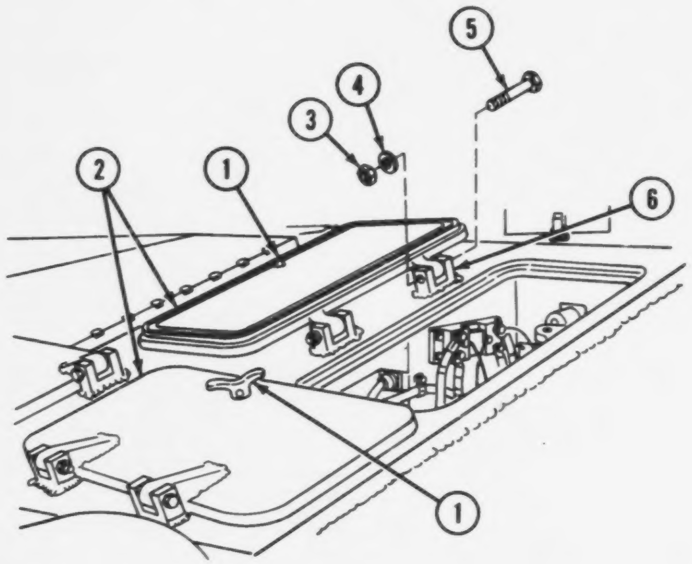
General Safety Instructions:

Batteries can explode. Do not smoke, have open flames, or make sparks around a battery. Battery acid and corrosion can burn your skin, eyes and clothing. Wear protective attire.

WARNING

Turn MASTER switch OFF. Disconnect battery ground cables.

When working around batteries wear eye protection. Remove all jewelry, dog tags and metal items.



REMOVAL

A Unscrew handles (1) and open battery access doors (2).

B Remove two self-locking nuts (3), two flat washers (4) and two screws (5) releasing each battery access door (2) from hull-mounted hinge bases (6). Discard self-locking nuts.

C Remove handles (1), if necessary (p 9-66.15).

INSTALLATION

A Install handles (1), if necessary (p 9-66.15).

B Install door (2) on hull-mounted hinge bases (6) with two screws (5), two flat washers (4) and two new self-locking nuts (3).

F Close and secure doors (2).

TA312990

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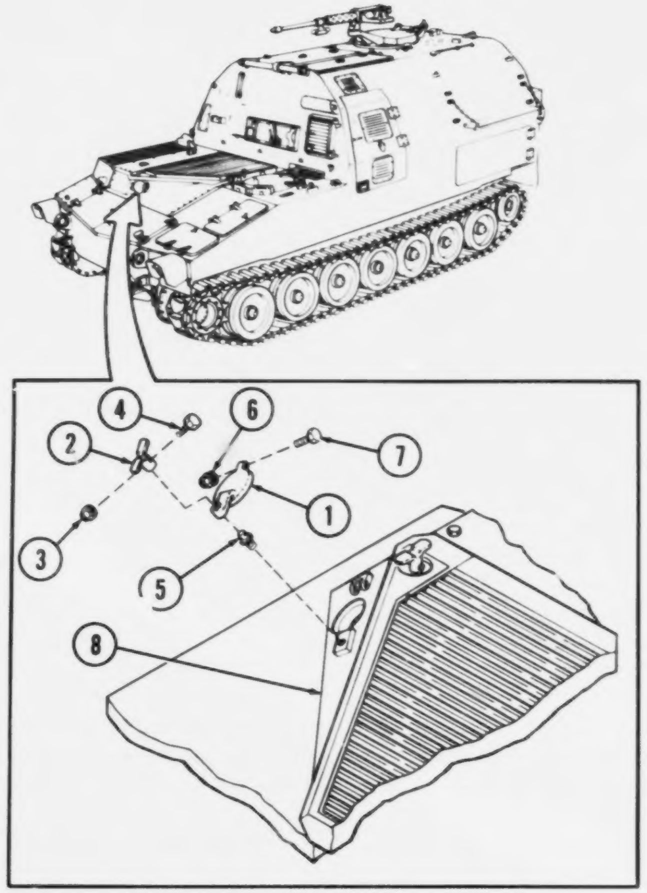
ENGINE DIPSTICK ACCESS DOOR: REMOVAL AND INSTALLATION



REMOVAL

A Open engine dipstick access door (1) by turning handle (2) counterclockwise.

B Remove and discard self-locking nut (3). Remove screw (4).

C Pull handle (2) from stud (5).

D Remove and discard self-locking nut (6). Remove screw (7), releasing engine dipstick access door (1) from front slope plate (8).

INSTALLATION

A Install engine dipstick access door (1) on front slope plate (8) with screw (7) and new self-locking nut (6).

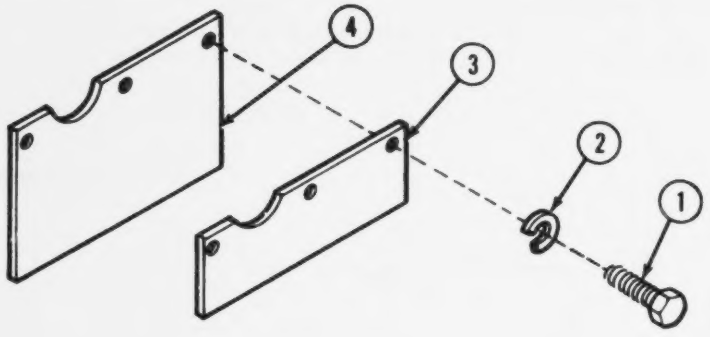
B Insert stud (5) through from underside of engine dipstick access door (1). Install handle (2) on stud (5) with screw (4) and self-locking nut (3).

C Close and secure engine dipstick access door (1).

TA312991

Section IV FRONT FENDERS, REAR TRACK SPLASH GUARDS AND TOWING PINTLE

FRONT FENDER: REMOVAL AND INSTALLATION



NOTE

This procedure applies to both front fenders and retainers.

REMOVAL

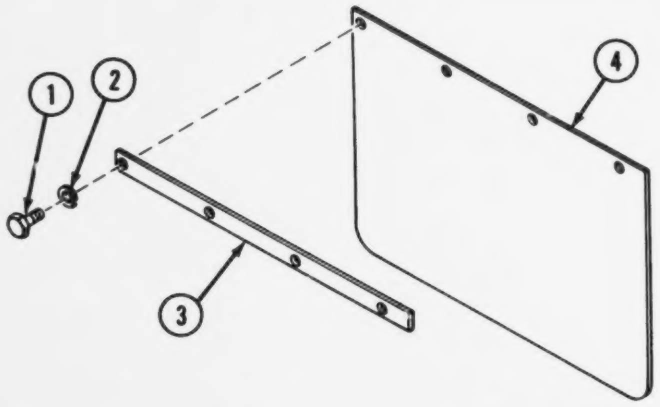
A Remove three screws (1), three lockwashers (2) and fender retainer (3).

B Remove front fender (4) from vehicle.

INSTALLATION

Reverse removal procedures.

REAR TRACK SPLASH GUARD: REMOVAL AND INSTALLATION



NOTE

This procedure applies to both rear track splash guards and strips.

REMOVAL

A Remove four screws (1), four lockwashers (2) and splash guard strip (3).

B Remove rear track splash guard (4) from vehicle.

INSTALLATION

Reverse removal procedures.

TA310053

PINTLE ASSEMBLY AND TOWING ATTACHMENTS: REMOVAL AND INSTALLATION

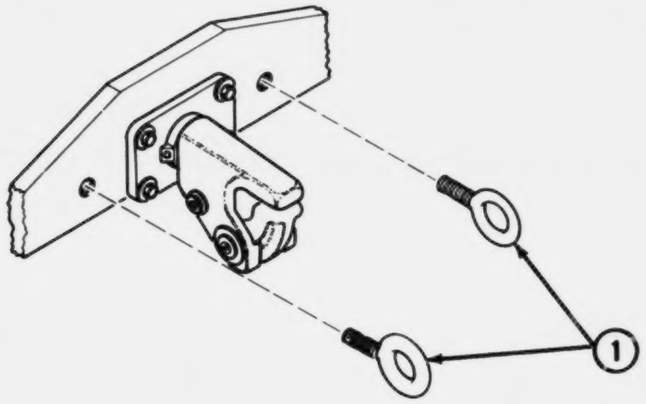
INITIAL SETUP

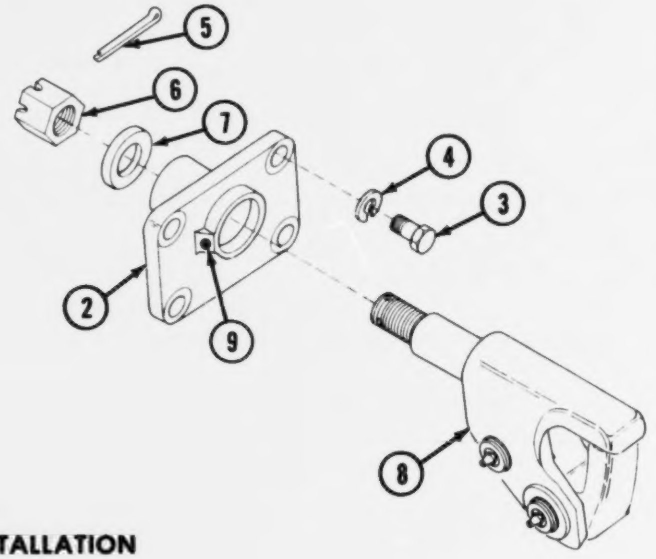
Materials/Parts:

Grease (item 27, Appx D)

References:

LO 9-2350-267-12





REMOVAL

A Remove two eyebolts (1).

B Remove bracket (2) by removing four screws (3) and four lockwashers (4). Discard lockwashers.

C Remove and discard cotter pin (5). Remove slotted nut (6) and bearing (7). Pull pintle assembly (8) from bracket (2).

INSTALLATION

A Apply liberal coating of grease (item 27, Appx D) to shaft and threads of pintle assembly (8).

B Insert pintle assembly (8) through bracket (2).

C Install bearing (7), nut (6) and a new cotter pin (5).

D Install bracket (2) with four screws (3) and four new lockwashers (4).

E Apply grease (item 27, Appx D) through fitting (9) to fill bracket (2) (LO 9-2350-267-12).

F Install two eyebolts (1).

TA312992

PINTLE ASSEMBLY: DISASSEMBLY, REPAIR AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)
Pliers, snapring (item 53, Appx B)

Materials/Parts:

Dry-cleaning solvent (item 19, Appx D)

References:

LO 9-2350-267-12

Equipment Condition:

Pintle assembly and bracket removed from vehicle (p 9-68).

DISASSEMBLY

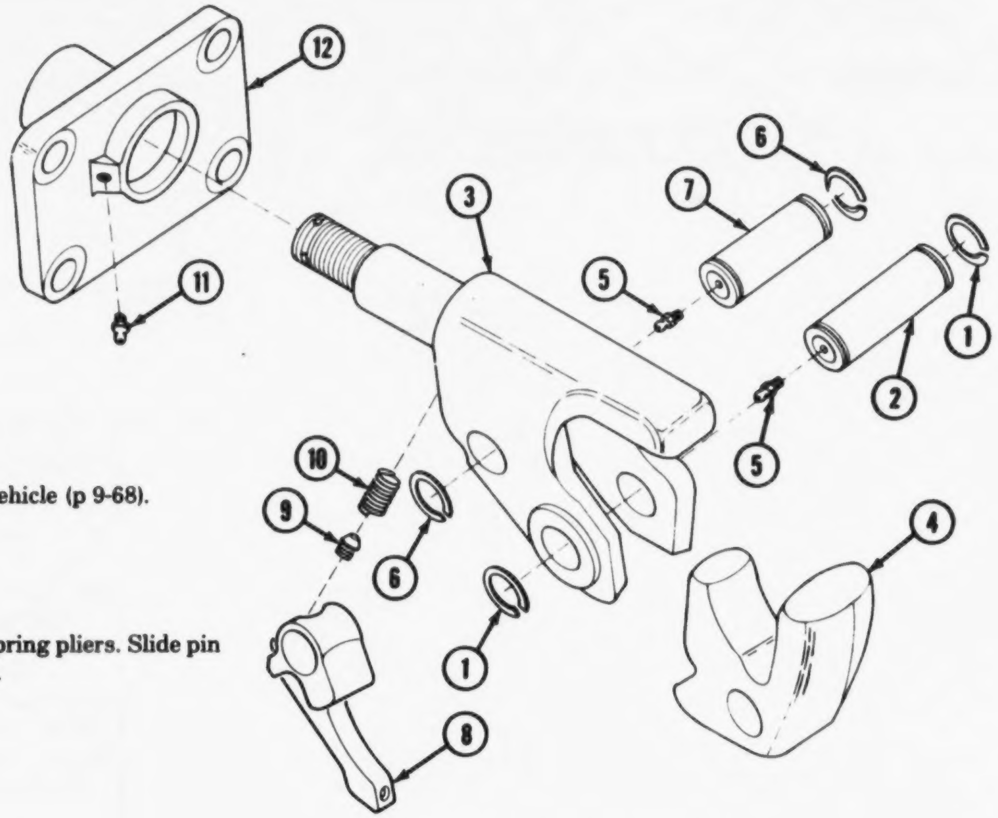
A Remove two retaining rings (1) using snapring pliers. Slide pin (2) from pintle body (3) releasing jaw (4).

B Remove fitting (5) from pin (2).

NOTE

Spring will drop out of pintle body when latch is removed. Set aside.

C Remove two retaining rings (6) using snapring pliers. Slide pin (7) from pintle body (3) releasing latch (8).



D Remove pin (9) and spring (10).

E Remove fitting (5) from pin (7).

F Remove fitting (11) from bracket (12).

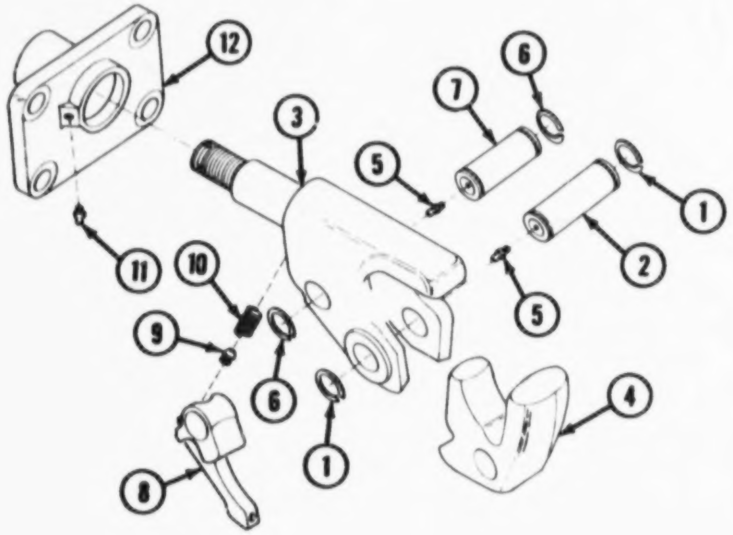
TA312993

PINTLE ASSEMBLY: DISASSEMBLY, REPAIR AND ASSEMBLY (CONTINUED)

REPAIR

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.



A Clean all parts with dry-cleaning solvent (item 19, Appx D) and wire brush (item 48, Appx B).

B If spring (10) is less than 3 inches long, replace it.

C Clean grease holes in pins (2 and 7) and in bracket (12).

ASSEMBLY

A Install fitting (11) in bracket (12).

B Insert spring (10) into hole on underside of pintle body (3). Install pin (9) in latch (8) with pin (7) and two retaining rings (6).

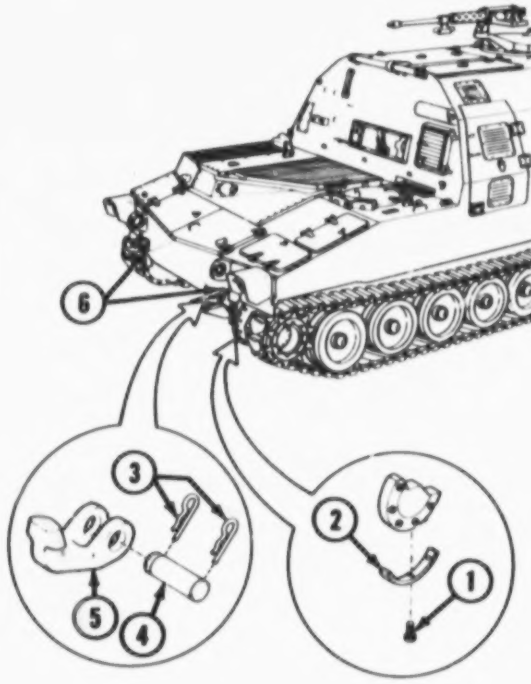
C Insert fitting (5) in pin (2).

D Position jaw (4) in closed position on pintle body (3) and secure with pin (2) and two retaining rings (1).

E Grease fittings (5 and 11) to expel all air (LO 9-2350-267-12).

TA312994

TOW CABLE HOOKS AND FINAL DRIVE SKID PLATES: REMOVAL AND INSTALLATION



REMOVAL

A Remove three screws (1) and skid plate (2) from left or right final drive assembly.

NOTE

All tow cable hooks are removed in same manner.

B Remove two lock pins (3) from pin (4). Drive lock pin (4) from hook (5), releasing hook from bracket (6).

INSTALLATION

NOTE

All tow cable hooks are installed in same manner.

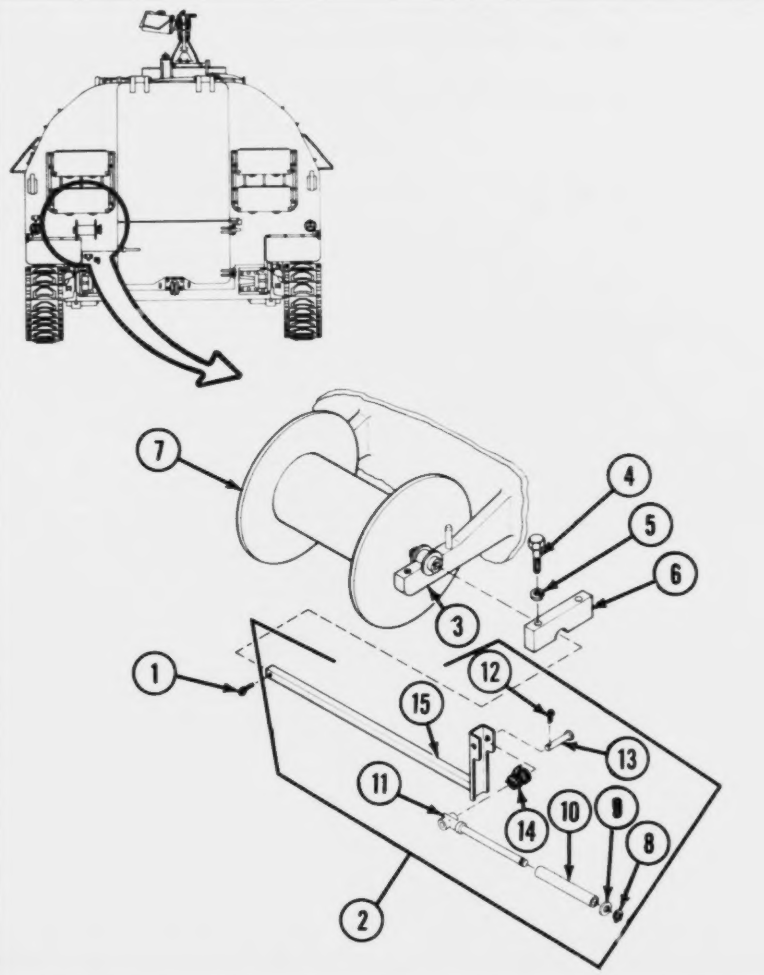
A Install hook (5) on bracket (6) with pin (4) and two lock pins (3).

B Install skid plate (2) on left or right final drive assembly with three screws (1).

TA312995

Section V TELEPHONE HAND REEL

TELEPHONE HAND REEL: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove pin (1) and pull hand crank assembly (2) from mount (3).

B Remove two screws (4), two lockwashers (5) and two clamps (6).

C Remove reel assembly (7).

DISASSEMBLY

A Remove ring (8) and washer (9), and pull sleeve (10) from crank handle (11).

B Remove cotter pin (12) from pin (13).

C Remove pin (13), spring (14) and handle (11) from crank (15).

ASSEMBLY

Reverse disassembly procedures.

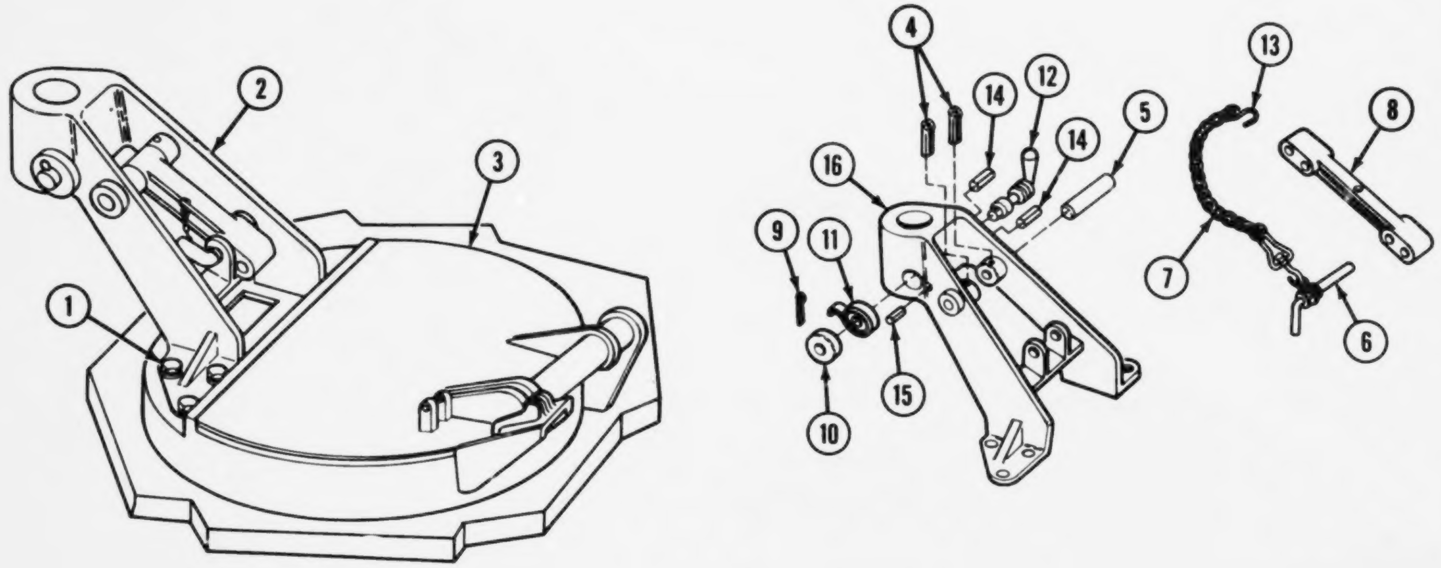
INSTALLATION

Reverse removal procedures.

TA310055

Section VI MACHINE GUN MOUNT-M2

MACHINEGUN SUPPORT ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove six screws (1), releasing support assembly (2).

B Lift support assembly (2) from commander's cupola (3).

DISASSEMBLY

A Remove and discard two cotter pins (4).

B Drive out straight pin (5) using punch and hammer.

TA312996

MACHINEGUN SUPPORT ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

C Remove quick-release pin (6), chain (7), and connecting link (8).

D Remove and discard cotter pin (9).

E Remove cover (10), spring (11) and lock (12).

F Remove S-hook (13), chain (7) and quick-release pin (6) from connecting link (8).

G Drive out spring pins (14) using punch and hammer. Discard spring pins.

H Drive out spring pin (15) using punch and hammer. Discard spring pin.

ASSEMBLY

A Install new spring pin (15) in support (16).

B Install two new spring pins (14).

C Install S-hook (13), chain (7) and quick-release pin (6) on connecting link (8).

D Install lock (12) on right-hand side of support (16). Position spring (11) to engage slotted end of lock (12). Anchor tang of spring (11) on spring pin (15).

E Check travel of lock handle (12). Spring load should cause lock (12) to partially close pintle hole in support (16). One-finger pressure to rotate lock (12) should fully open pintle hole.

F Install cover (10) over spring (11) with new cotter pin (9).

G Install connecting link (8) in support (16) with straight pin (5). Secure straight pin (5) and two new cotter pins (4).

H Secure connecting link (8) with quick-release pin (6).

INSTALLATION

Install support assembly (2) on commander's cupola (3) with six screws (1).

TA312997

CHAPTER 10
MAINTENANCE PROCEDURES: STOWAGE

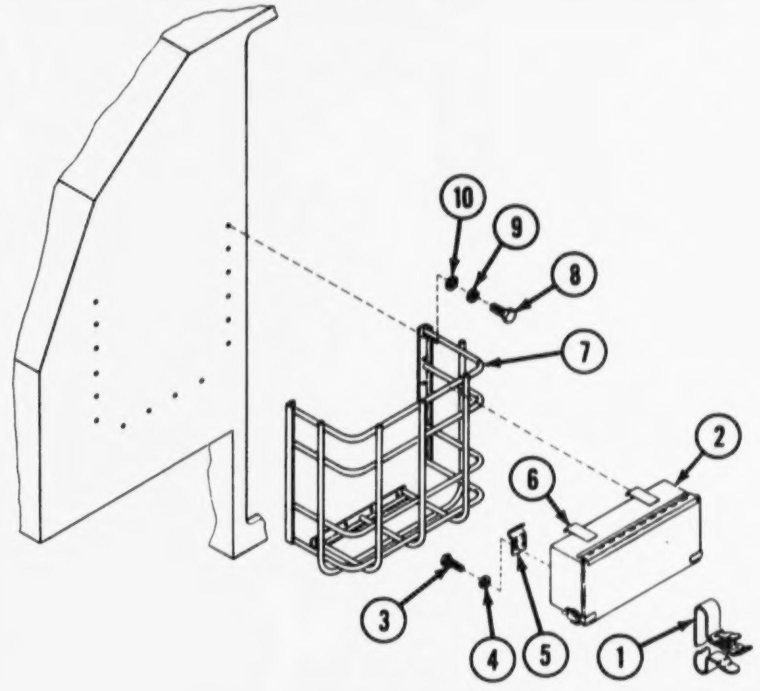
CHAPTER OVERVIEW

This chapter contains instructions for removal and installation of major components required for mounting and securing stowage items inside and outside the M992 cargo compartment.

Section I	Outside Stowage
Section II	Inside Stowage

Section I OUTSIDE STOWAGE

STOWAGE BOXES AND BASKETS: REMOVAL AND INSTALLATION



REMOVAL

NOTES

- Both stowage boxes are removed in the same way.
- Vehicles number 345 and above have only one stowage basket.

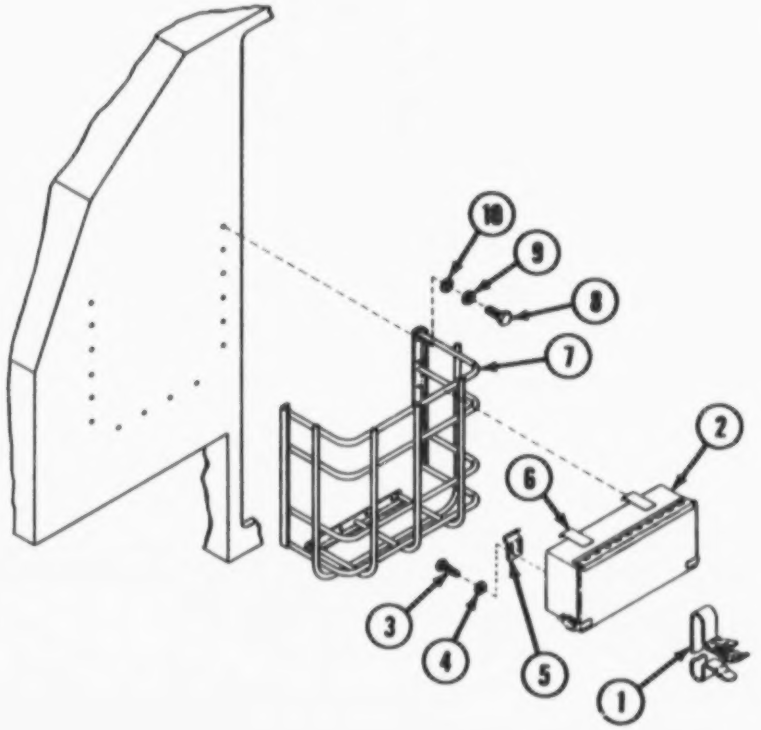
A Remove two bedroll stowage straps (1) from around stowage box (2).

B Remove stowage box (2) by removing eight screws (3), eight flat washers (4) and two supports (5) from stowage box brackets (6). Then lift box off stowage basket (7).

C Remove basket (7) from vehicle by removing 16 screws (8), 16 lockwashers (9) and 16 flat washers (10). Discard lockwashers.

TA57264

STOWAGE BOXES AND BASKETS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

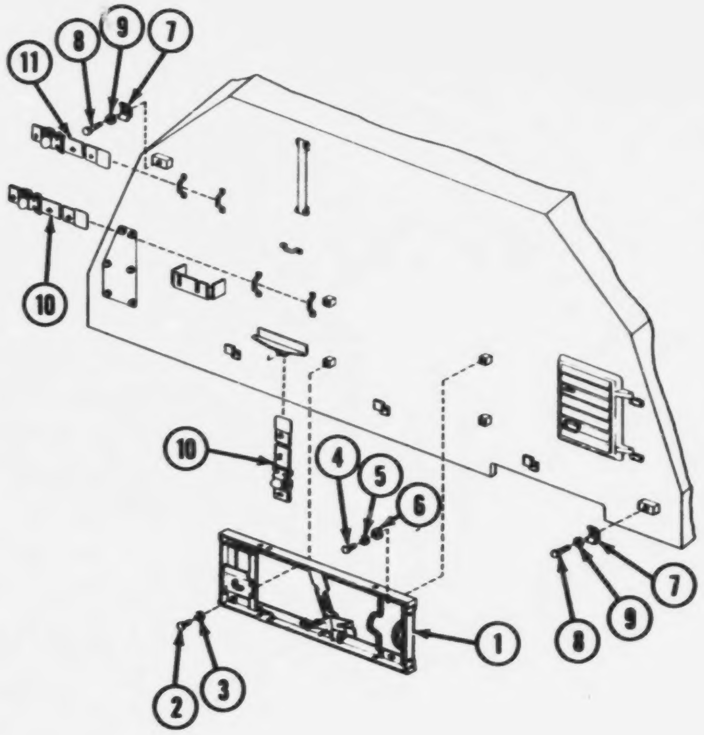
A Install basket (7) on vehicle with 16 screws (8), 16 new lockwashers (9) and 16 flat washers (10).

B Install stowage box (2) on basket (7) with eight screws (3) and eight flat washers (4) to secure two supports (5) to stowage box brackets (6).

C Install two bedroll stowage straps (1) around stowage box (2).

TA57265

PIONEER KIT, TOWING CABLE STRAPS, WATER CAN STRAPS AND TRACK FIXTURE STRAP: REMOVAL AND INSTALLATION



REMOVAL

A Remove pioneer kit (1) by removing two screws (2), two lockwashers (3), two screws (4), two lockwashers (5) and two flat washers (6).

B Remove each of two towing cable straps (7) by removing from each: one screw (8) and one flat washer (9).

C Remove two water can straps (10) by grasping buckle end of strap and pulling through vehicle-mounted strap fasteners and support.

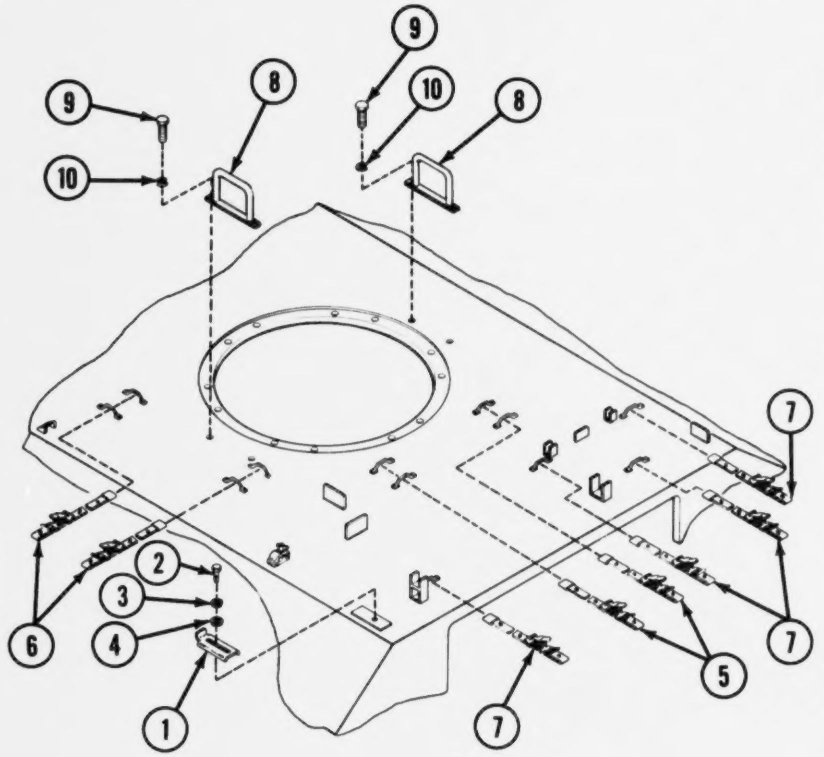
D Remove track fixture strap (11) by grasping buckle end of strap and pulling through two vehicle-mounted strap fasteners.

INSTALLATION

Reverse order of removal procedures.

TA310324

CROWBAR STOP, BARREL STRAPS, RACK HOIST STRAPS: REMOVAL AND INSTALLATION



REMOVAL

A Remove crowbar stop (1) by removing one screw (2), one lockwasher (3) and one flat washer (4).

B Remove two barrel straps (5) by grasping buckle end of strap and pulling each through vehicle-mounted strap fastener.

C Remove two rack hoist straps (6) by grasping buckle end of strap and pulling each through vehicle-mounted strap fasteners.

D Remove four shovel and pick straps (7) by grasping buckle end of strap and pulling each through vehicle-mounted strap fastener.

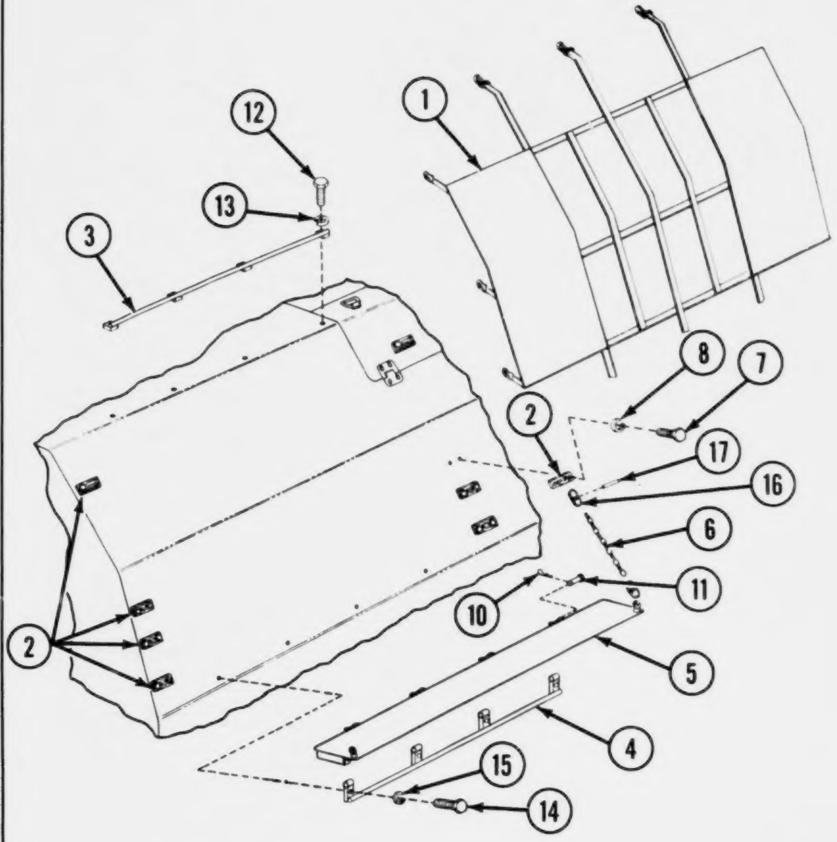
E Remove two handle assemblies (8) by removing from each, two screws (9) and two lockwashers (10).

INSTALLATION

Reverse order of removal procedures.

TA310325

DUFFLE BAG STOWAGE (RIGHT SIDE): REMOVAL AND INSTALLATION



(RIGHT SIDE): REMOVAL AND INSTALLATION

REMOVAL

A Unhook and remove net (1) from duffle bag stowage eyelets (2) and bar assemblies (3 and 4).

B Fold up shelf assembly (5) to relieve tension on two support chains (6). Remove 16 screws (7) and 16 lockwashers (8), and remove eight eyelets (2).

C Holding shelf (5) and remove four cotter pins (10) and four pins (11) and remove shelf (5) from side of vehicle hull.

D Remove four screws (12) and four lockwashers (13), and remove bar (3) from topside of vehicle hull.

E Remove four screws (14) and four lockwashers (15), and remove bar (4) from side of vehicle hull.

NOTE

Disassemble connecting links only if necessary for replacement.

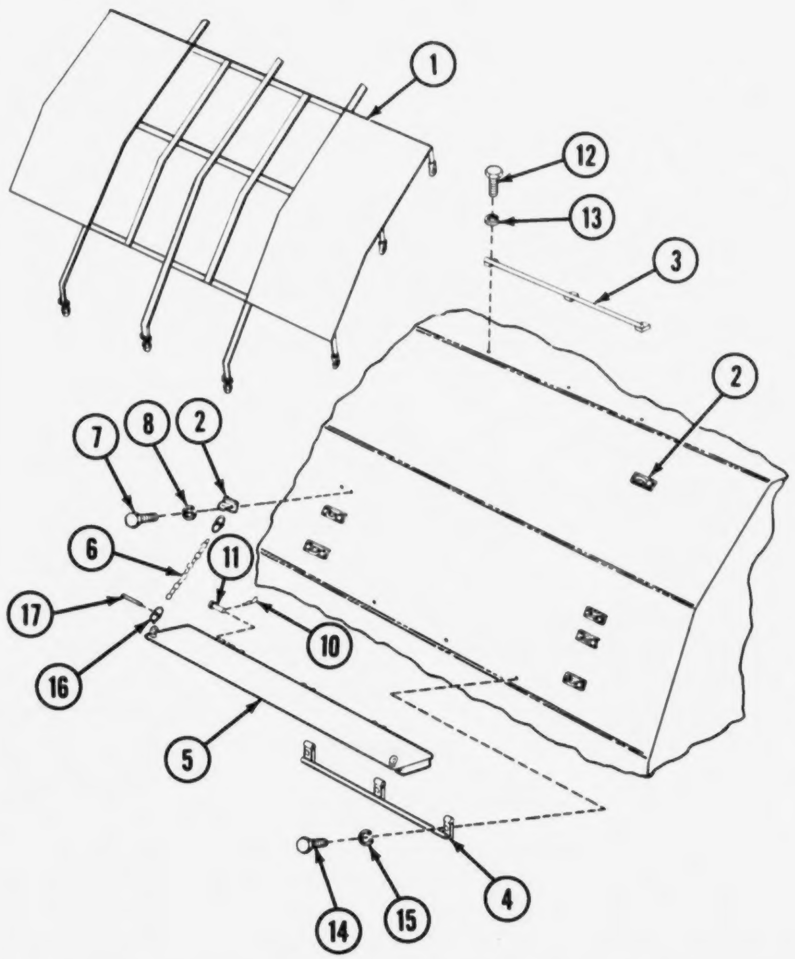
F Remove two support chains (6) from two eyelets (2) and shelf (5), by disassembling two connecting links (16) on each chain assembly. Grind peened ends of connecting link pin (17) and drive pin from assembly.

INSTALLATION

Reverse order of removal procedures.

TA310326

DUFFLE BAG STOWAGE (LEFT SIDE): REMOVAL AND INSTALLATION



REMOVAL

A Unhook and remove net (1) from duffle bag stowage eyelets (2) and bar assemblies (3 and 4).

B Fold up shelf assembly (5) to relieve tension on two support chains (6). Remove 16 screws (7) and 16 lockwashers (8) and remove eight eyelets (2).

C Holding shelf (5), remove three cotter pins (10) and three pins (11), and remove shelf (5) from side of vehicle hull.

D Remove three screws (12) and three lockwashers (13), and remove bar (3) from topside of vehicle hull.

E Remove three screws (14) and three lockwashers (15), and remove bar (4) from side of vehicle hull.

NOTE

Disassemble connecting links only if necessary for replacement.

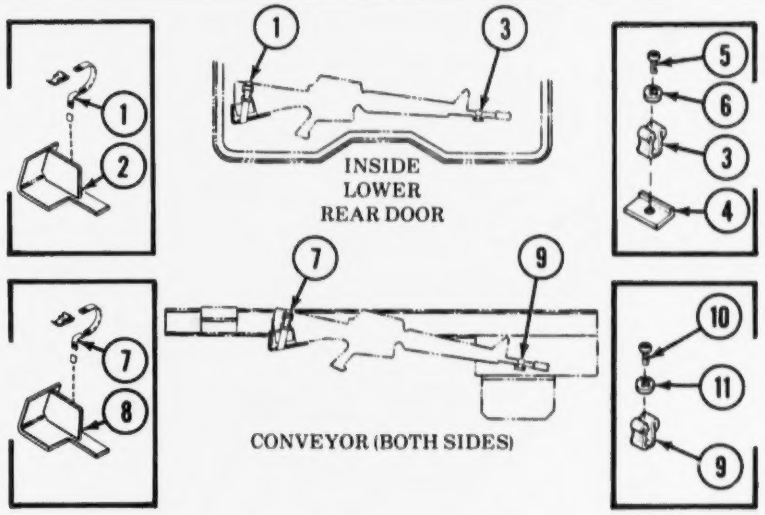
F Remove two support chains (6) from two eyelets (2) and shelf (5) by disassembling two connecting links (16) on each chain assembly. Grind peened ends of connecting link pin (17) and drive pin from assembly.

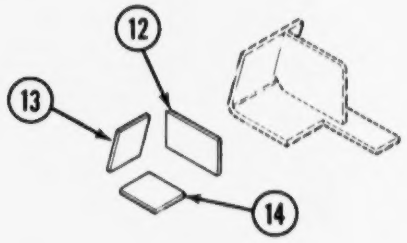
INSTALLATION

Reverse order of removal procedures.

TA310327

RIFLE STOWAGE CLIPS: REMOVAL AND INSTALLATION





REMOVAL

A Unbuckle and remove strap (1) from lower rear door bracket (2).

B Remove clip (3) from lower rear door plate (4) by removing one screw (5) and one lockwasher (6).

NOTE

Straps and clips are located on both sides of conveyor.

C Unbuckle and remove one strap (7) from bracket (8) at each side of conveyor.

D Remove two clips (9) from each side of conveyor by removing two screws (10) and two lockwashers (11).

NOTE

Rubber pads on all three rifle butt brackets are removed in same manner.

E Remove rubber pads (12, 13 and 14) from rifle butt brackets (2 and 8).

INSTALLATION

A Clean inside surfaces of rifle butt brackets (2 and 8) to remove softened or dissolved material and other contaminants.

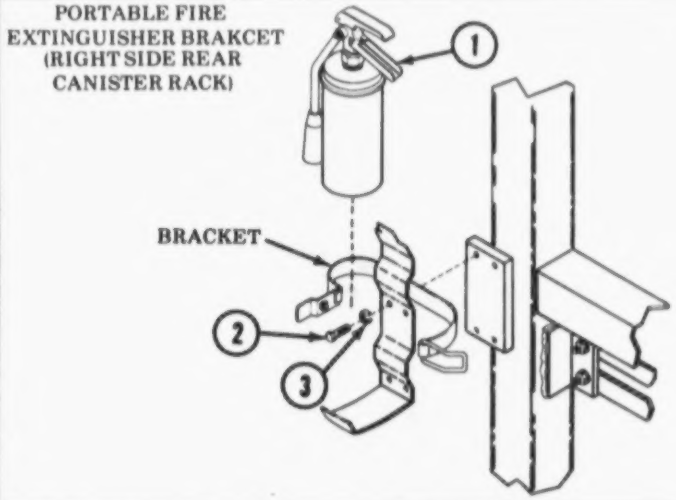
B Apply thin coat of adhesive cement (item 2, Appx D) to areas on rifle butt brackets requiring rubber pads. Allow to dry until tacky.

C Install rubber pads (12, 13 and 14) on rifle butt brackets (2 and 8).

D Reverse order of removal procedures.

TA310328

PORTABLE FIRE EXTINGUISHER AND BRACKET (RIGHT SIDE REAR CANISTER RACK): REMOVAL AND INSTALLATION


PORTABLE FIRE
EXTINGUISHER BRAKCET
(RIGHT SIDE REAR
CANISTER RACK)
①
BRACKET
②
③

REMOVAL

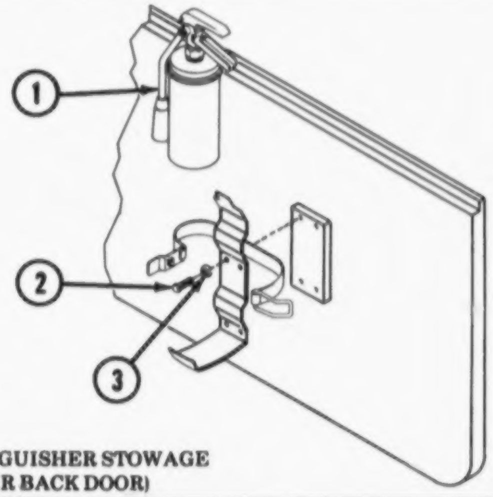
A Unstrap and remove portable fire extinguisher (1) from bracket.

B Remove four screws (2), four lockwashers (3), and remove bracket from right front canister rack.

INSTALLATION

Reverse order of removal procedures.

PORTABLE FIRE EXTINGUISHER BRACKET (LOWER REAR DOOR): REMOVAL AND INSTALLATION



FIRE EXTINGUISHER STOWAGE
(LOWER BACK DOOR)

REMOVAL

A Unstrap and remove portable fire extinguisher (1) from bracket.

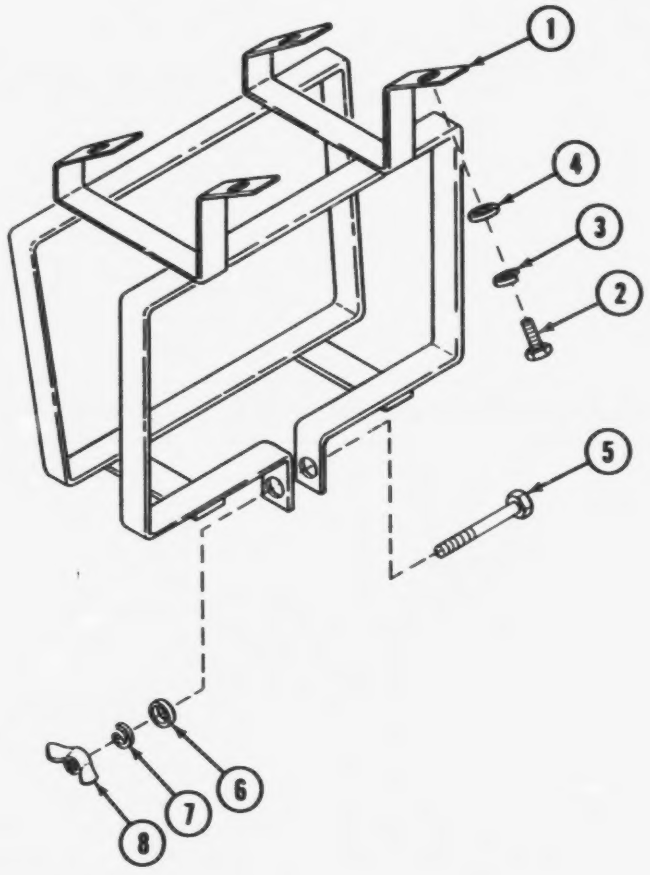
B Remove four screws (2), four lockwashers (3), and remove bracket from lower back door.

INSTALLATION

Reverse order of removal procedures.

TA310329

NIGHT VISION GOGGLES CARRYING CASE BRACKET: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

Remove carrying case bracket (1) by removing four screws (2), four lockwashers (3) and four flat washers (4).

DISASSEMBLY

Remove from each bracket (1) strap, one screw (5), one flat washer (6), one lockwasher (7) and one wing nut (8).

ASSEMBLY

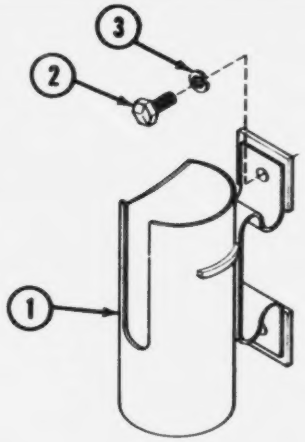
Reverse order of disassembly procedure.

INSTALLATION

Reverse order of removal procedure.

TA310330

FLASHLIGHT HOLDERS, COMMANDER'S STATION, DRIVER'S BULKHEAD AND LOWER REAR DOOR: REMOVAL AND INSTALLATION



NOTE

All three flashlight holders are mounted in same way. The following procedures cover removal of only one holder.

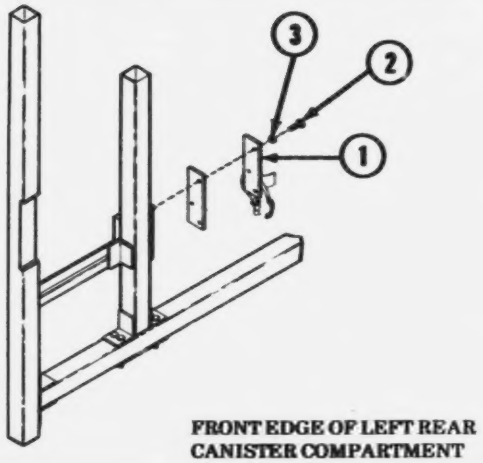
REMOVAL

Remove flashlight holder (1) by removing two screws (2) and two lockwashers (3).

INSTALLATION

Reverse order of removal procedure.

DECONTAMINATION APPARATUS BRACKET: REMOVAL AND INSTALLATION



FRONT EDGE OF LEFT REAR CANISTER COMPARTMENT

REMOVAL

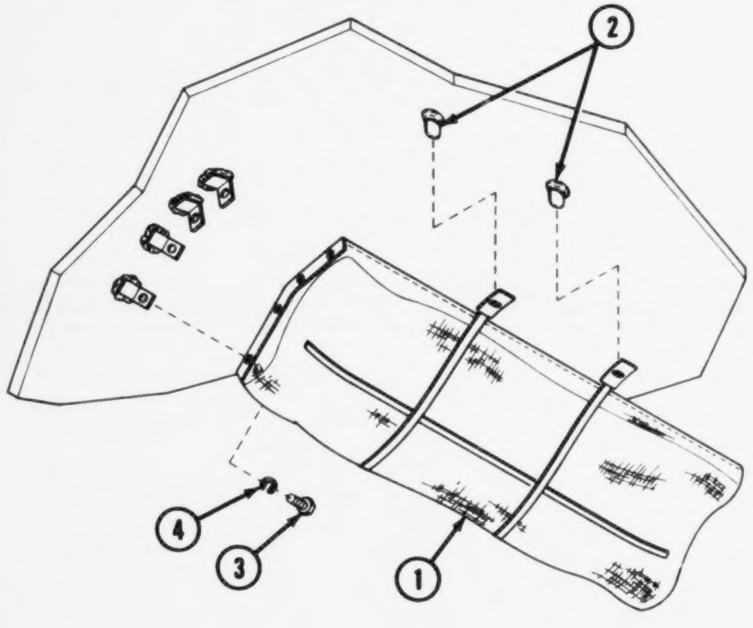
Remove decontamination apparatus bracket (1) by removing three screws (2) and three lockwashers (3).

INSTALLATION

Reverse order of removal procedure.

TA310331

LEFT AND RIGHT STOWAGE NETS: REMOVAL AND INSTALLATION



REMOVAL

A Release right rear and left rear stowage nets (1) from vehicle ceiling by turning two stud fasteners (2).

B Remove 17 screws (3) and 17 lockwashers (4) from each net. Discard lockwashers.

INSTALLATION

NOTE

When installing net, avoid overstretching net. Make sure screws are inserted properly and not cocked.

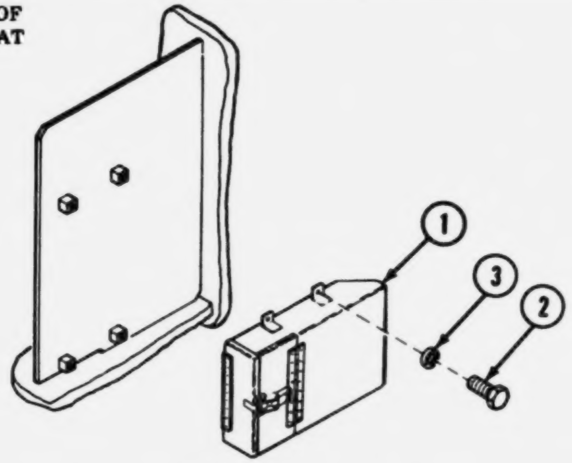
A Install right rear and left rear stowage nets (1) with 17 screws (3) and 17 new lockwashers (4).

B Secure nets (1) to vehicle ceiling by turning two stud fasteners (2).

TA313000

M45 PERISCOPE STOWAGE BOX: REMOVAL AND INSTALLATION

LEFT REAR OF
DRVER'S SEAT



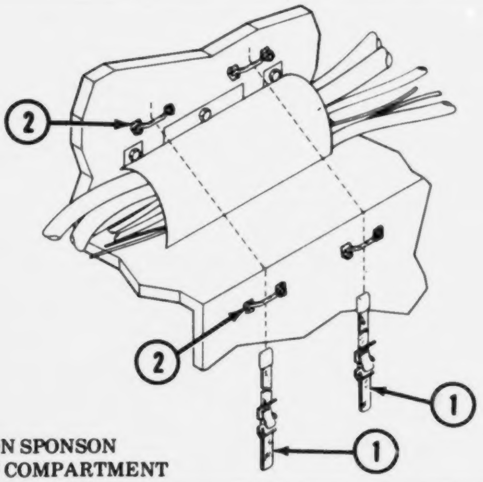
REMOVAL

Remove periscope stowage box (1) from vehicle by removing four screws (2) and four lockwashers (3).

INSTALLATION

Reverse order of removal procedure.

STOWAGE STRAPS, FUZES: REMOVAL AND INSTALLATION



STOWAGE ON SPONSON
UNDER APU COMPARTMENT

REMOVAL

Unbuckle and remove two straps (1) by pulling ends through vehicle-mounted strap fasteners (2).

INSTALLATION

Reverse order of removal procedure.

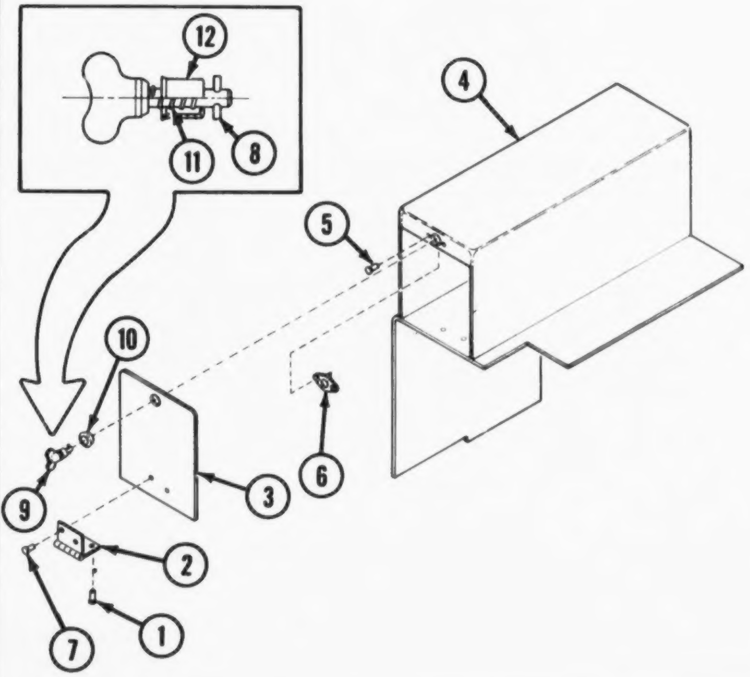
TA310333

DRIVER'S STOWAGE BOX: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Blind hand riveter (item 47, Appx B)
Bit, drill, 3/16 in. (item 46, Appx B)
Drill, portable electric (item 50, Appx B)



DISASSEMBLY

A Drill out two rivets (1) releasing hinge (2) and door (3) from stowage box (4).

B Drill out two rivets (5) releasing turnlock receptacle (6) from box (4).

C Take door (3) and attached parts to suitable workbench.

D Drill out two rivets (7) releasing hinge (2) from door (3).

E Drive cross pin (8) from stud assembly (9). Pull stud assembly (9) from turnlock eyelet (10). Reinsert cross pin (8) into stud assembly (9) to avoid losing spring (11) and spring cup (12).

F Drive turnlock eyelet (10) from door (3).

ASSEMBLY

A Drive turnlock eyelet (10) into door (3).

B Remove cross pin (8). Press stud assembly (9) through turnlock eyelet (10) to compress spring cup (12) and spring (11). Insert cross pin (8).

C Install hinge (2) on door (3), with two rivets (7).

D Return to driver's compartment.

E Install turnlock receptacle (6) on stowage box (4), with two rivets (5).

F Install hinge (2) and attached parts on stowage box (4) with two rivets (1).

G Close door (3). Check fit and engagement of turnlock parts.

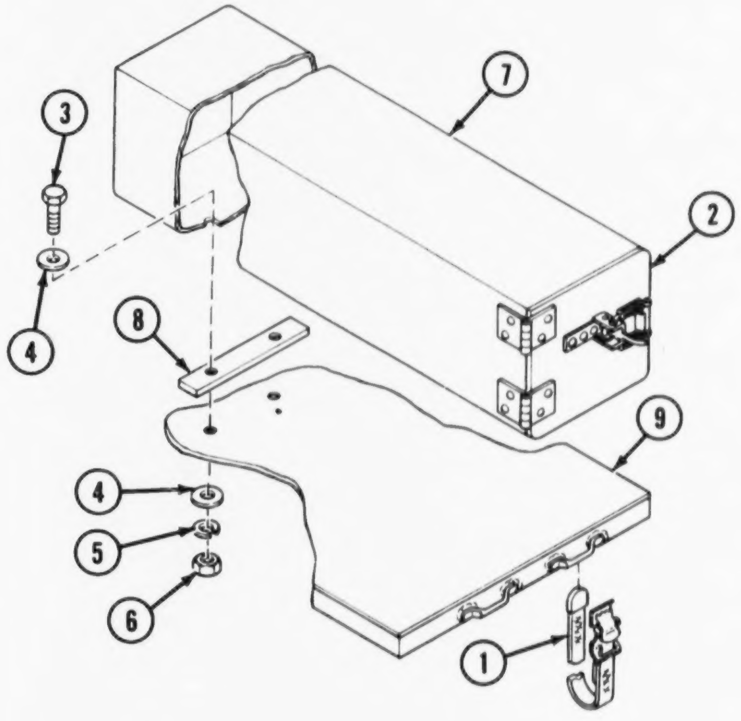
TA313001

NBC STOWAGE BOX: REMOVAL AND INSTALLATION

INITIAL SETUP

Personnel Required:

Two



REMOVAL

A Open and secure personnel side door.

B Remove restraint straps (1) (p 11-22).

C Open NBC stowage box door (2).

D Remove four screws (3), eight flat washers (4), four lockwashers (5) and four nuts (6). Discard lockwashers.

E Remove stowage box (7) and two spacers (8) from right front canister shelf (9).

INSTALLATION

A Position two spacers (8) and stowage box (7) on right front canister shelf (9).

B Install four screws (3), eight flat washers (4), four new lockwashers (5) and four nuts (6).

C Close and secure NBC stowage box door (2).

D Install restraint straps (1) (p 11-22).

E Close and secure personnel side door.

TA57455

CHAPTER 11
AMMUNITION STOWAGE RACKS MAINTENANCE PROCEDURE

CHAPTER OVERVIEW

This chapter contains instructions for removal and installation of projectile rack, rack supports and restraints, and canister compartment components.

Section I Projectile Racks
Section II Canister Compartments
Section III Canister Restraints

TA57266

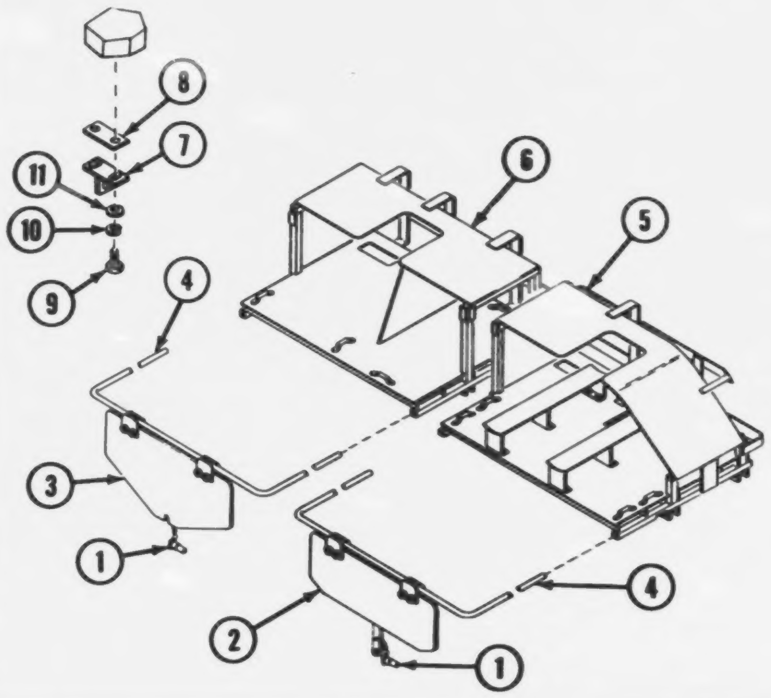
Section I PROJECTILE RACKS

PROJECTILE RACK STOWAGE BOX GUARD PLATE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Equipment Conditions:

Both projectile racks removed from vehicle (p 11-5).
Stowage boxes empty.



TA57470

REMOVAL

A Pull two quick-release pins (1) and fold down two guard plates (2 and 3).

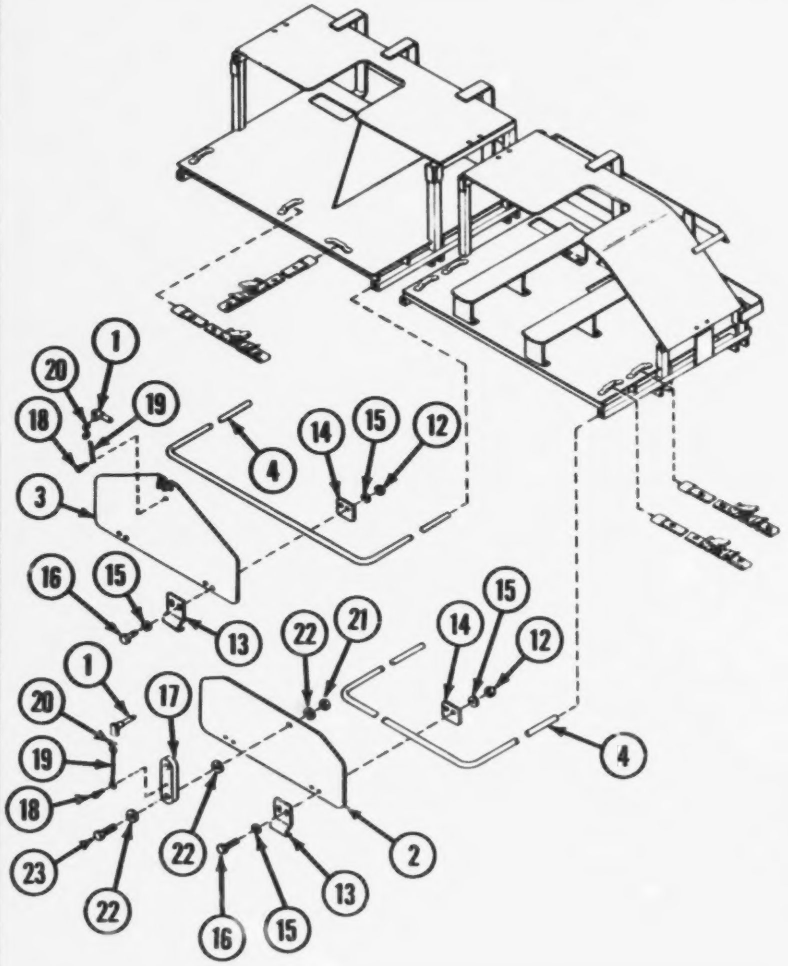
B Grasp pivot bar (4) of each guard plate (2 and 3) and pull straight out, and remove from projectile stowage boxes (5 and 6).

NOTE

Note number, thickness and position of shims to ensure proper installation.

C Remove two brackets (7) and shims (8) from vehicle top doors by removing two screws (9), two lockwashers (10) and two flat washers (11) from each bracket (7). Discard lockwashers.

PROJECTILE RACK STOWAGE BOX GUARD PLATE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove guard plates (2 and 3) from pivot bars (4) by removing eight nuts (12), four supports (13), four plates (14), 16 flat washers (15), and eight screws (16).

B Remove quick-release pin (1) from guard plate (2) and bar (17) by removing screw (18). Remove other quick-release pin (1) from guard plate (3) by removing screw (18).

C Remove chain (19) and S-hook (20) from pins (1).

D Remove nut (21) three flat washers (22) bar (17) and screw (23) from guard plate (2).

ASSEMBLY

A Install S-hook (20) and chain (19) on each of two quick-release pins (1).

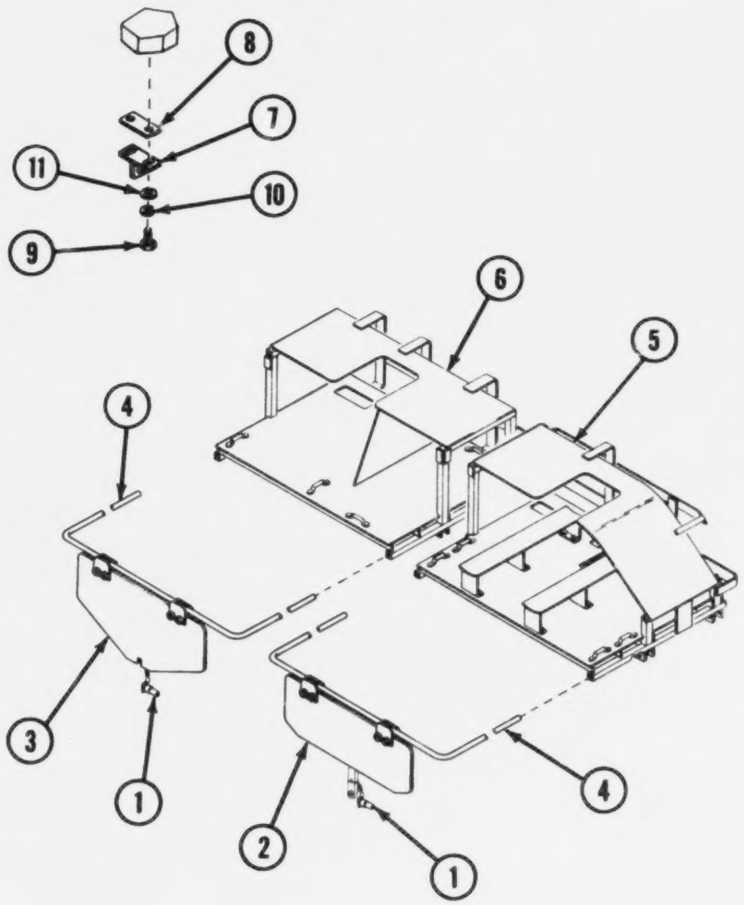
B Install quick-release pins (1) on guard plate (3) and on bar (17) using screw (18) at each place.

C Install guard plates (2 and 3) on pivot bars (4) using eight screws (16), two supports (13) two plates (14), eight flat washers (15) and eight nuts (12).

D Install screw (23), bar (17), three flat washers (22) and nut (21) on guard plate (2).

TA57471

PROJECTILE RACK STOWAGE BOX GUARD PLATE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Install two brackets (7) and shims (8) on vehicle top doors using two screws (9), two new lockwashers (10) and two flat washers (11) for each bracket (7).

B Install guard plates (2 and 3) on projectile stowage boxes (5 and 6) by grasping each pivot bar (4) and pushing straight in.

C Fold up two guard plates (2 and 3) and secure quick-release pins (1).

TA58026

PROJECTILE RACK BASE, SUPPORTS AND VEHICLE WALL-MOUNTED RESTRAINTS: REMOVAL AND INSTALLATION

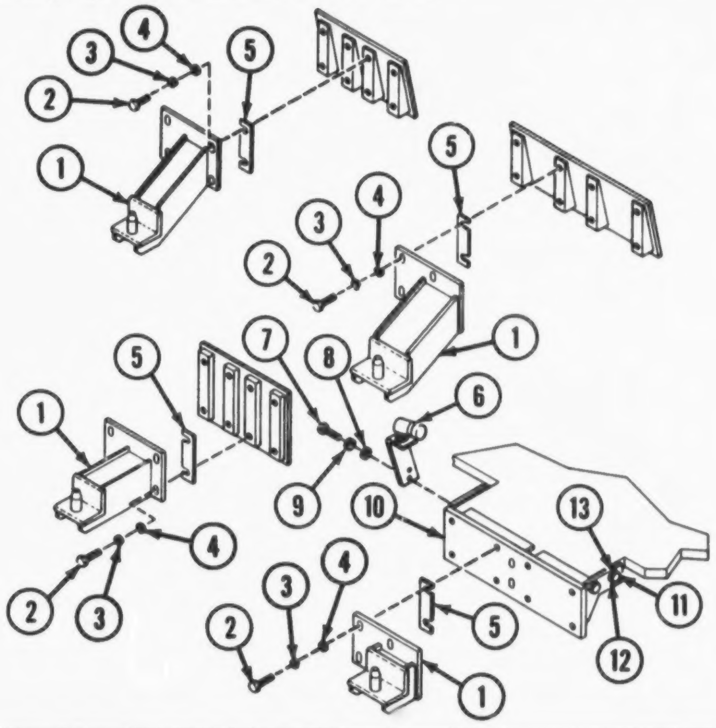
INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Equipment Condition:

Heating and ventilating distribution hoses removed (p 14-61).
Both projectile racks removed (p. 11-5).



REMOVAL

NOTE

Projectile rack restraints, supports and adapter are adjustable. Scribe marks are required before removal for correct installation of projectile racks. Note number of shims and install same number at installation.

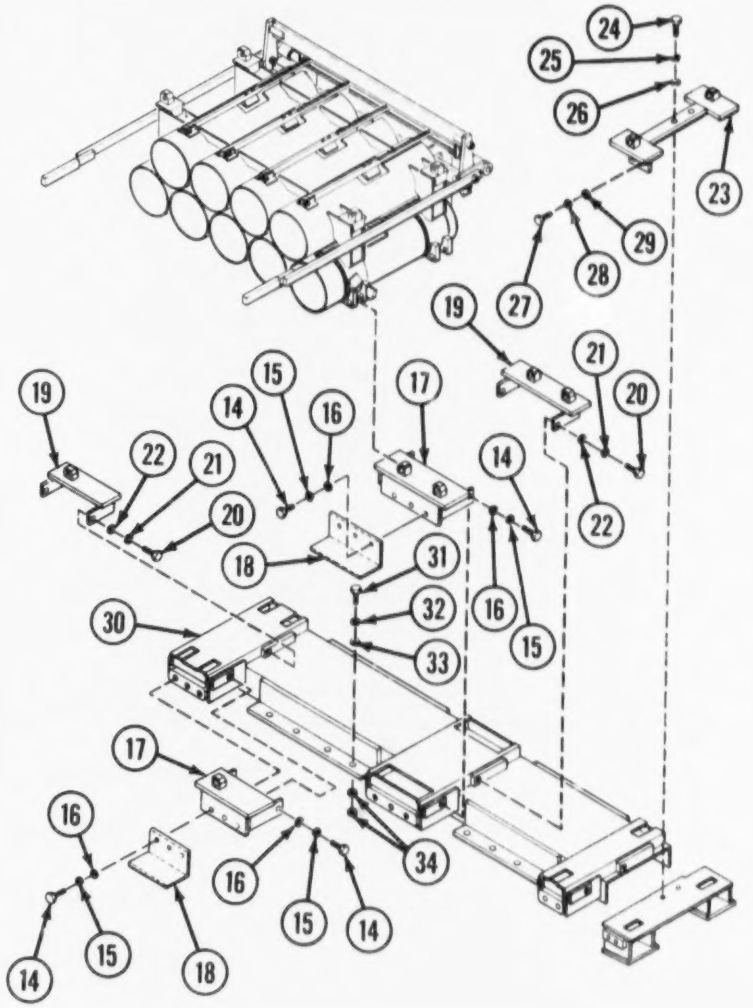
A Remove four rear rack restraints (1) from vehicle wall by removing from each, four screws (2), four lockwashers (3), four flat washers (4) and shims (5). Discard lockwashers.

B Remove air cleaner indicator and bracket (6) by removing screw (7), flat washer (8) and lockwasher (9). Discard lockwasher.

C Remove bracket (10) from forward bulkhead by removing four screws (11), four lockwashers (12) and four flat washers (13). Discard lockwashers.

TA58016

PROJECTILE RACK BASE, SUPPORTS AND VEHICLE WALL-MOUNTED RESTRAINTS: REMOVAL AND INSTALLATION (CONTINUED)



D Remove five screws (14), five lockwashers (15) and five flat washers (16) from both right and left front base supports (17). Remove supports (17) and angles (18) from vehicle floor. Discard lockwashers.

E Remove right and left rear base supports (19) by removing from each, two screws (20), two lockwashers (21) and two flat washers (22). Discard lockwashers.

F Remove adapter (23) from vehicle floor by removing two screws (24), two lockwashers (25) and two flat washers (26) from the top; and two screws (27), two lockwashers (28), and two flat washers (29) from the end. Discard lockwashers.

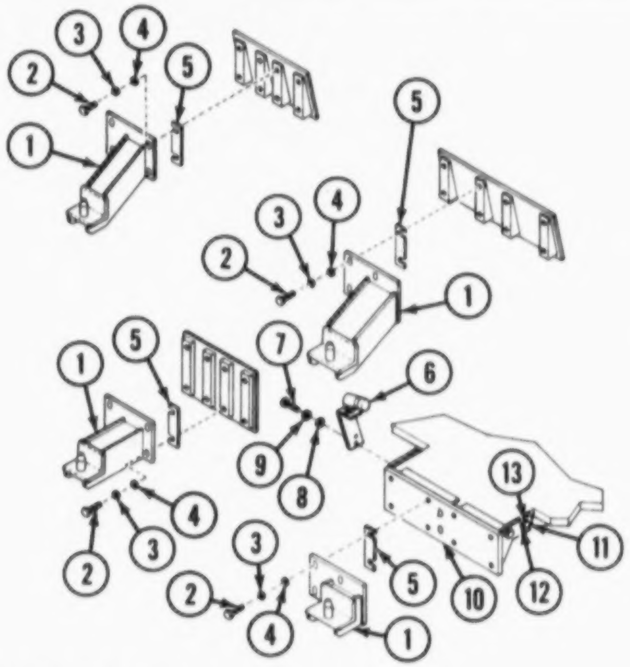
NOTE

Record number and location of flat washers used to shim rack base to ensure proper installation.

G Remove rack base (30) from vehicle floor by removing 16 screws (31), 16 lockwashers (32), 16 flat washers (33), and 32 flat washer shims (34). Discard lockwashers.

TA58095

PROJECTILE RACK BASE, SUPPORTS AND VEHICLE WALL-MOUNTED RESTRAINTS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTES

- Aline restraints, supports and adapter with scribe marks for correct positioning at installation.
- Apply zinc chromate paste (item 46, Appx D) between all steel and aluminum mating surfaces.
- Ensure that shims are installed in proper number and location.

A Install rack base (30) on vehicle hull floor with 16 screws (31), 16 new lockwashers (32), 16 flat washers (33), and 32 flat washer shims (34).

B Install adapter (23) on vehicle floor with two screws (24), two new lockwashers (25) and two flat washers (26) from the top; and two screws (27), two new lockwashers (28), and two flat washers (29) from the end.

C Install right and left rear base supports (19) with two screws (20), two new lockwashers (21) and two flat washers (22) for each support.

D Install right and left front base supports (17) and angles (18) on vehicle floor with five screws (14), five new lockwashers (15) and five flat washers (16) for each support.

NOTE

Install correct restraints in marked positions. Install correct number of shims between each restraint and bulkhead mounting area.

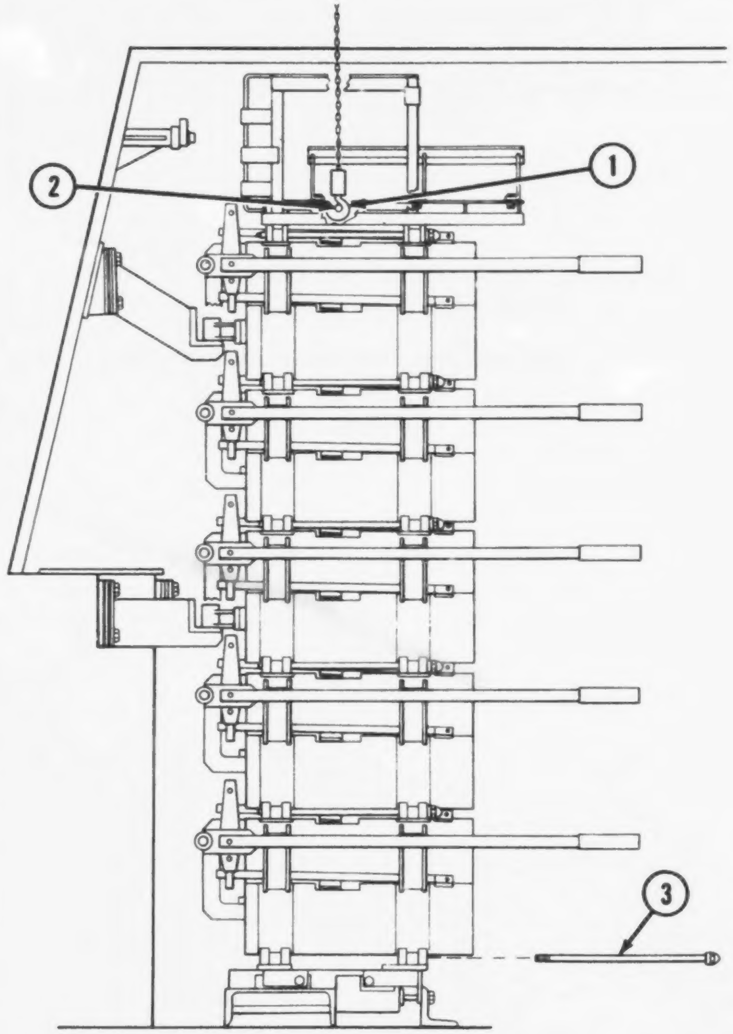
E Install bracket (10) on forward bulkhead with four screws (11), four new lockwashers (12) and four flat washers (13).

F Install air cleaner indicator and bracket assembly (6) with screw (7), flat washer (8) and new lockwasher (9).

G Install four rear rack restraints (1) and shims (5) on vehicle wall with four screws (2), four new lockwashers (3) and four flat washers (4) for each.

TA58085

PROJECTILE RACK: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two

Test Equipment/Special Tools:

Torque wrench, 0-175 lb-ft (item 74, Appx B)
Suitable lifting device

CAUTION

Stowage boxes and projectile racks must be empty before attempting to move rack assembly.

NOTE

Projectile racks are removed from vehicle through top doors.

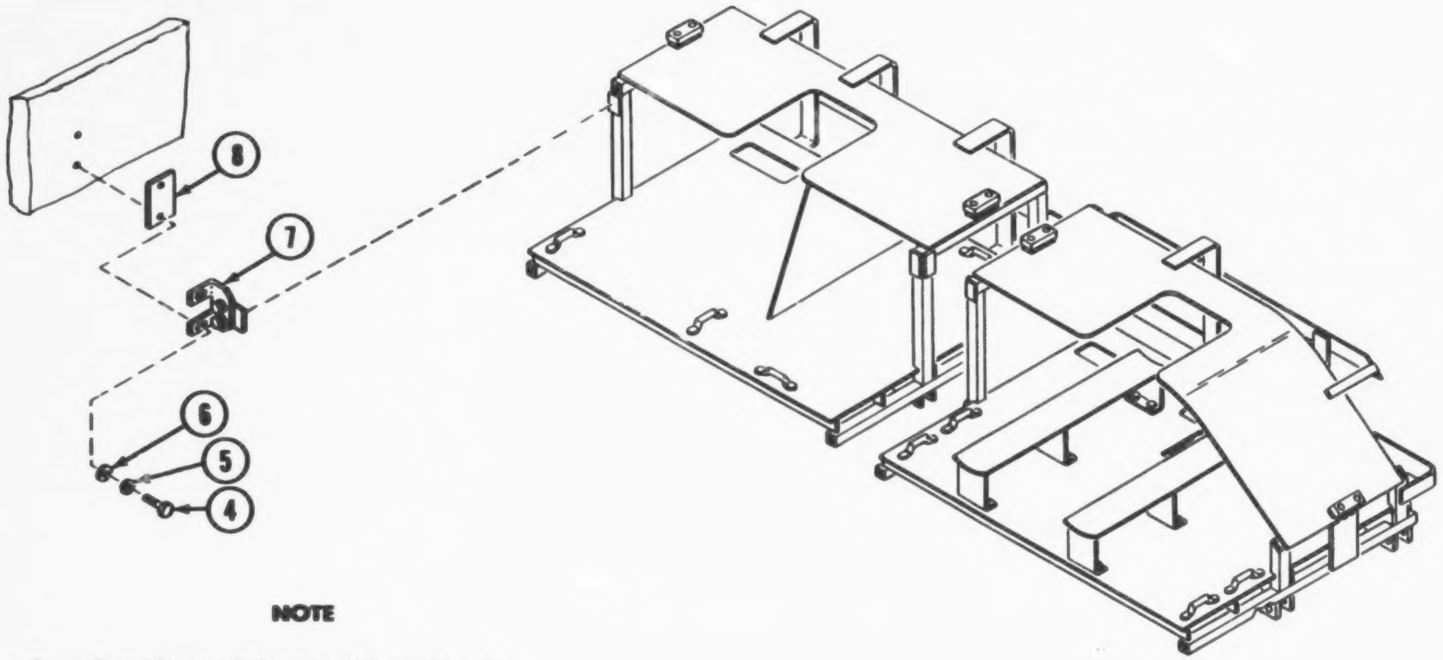
REMOVAL

A Use suitable lifting device and place hook (1) on bar (2) of projectile rack assembly.

B Remove two rods (3).

TA57472

PROJECTILE RACK: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



NOTE

Step C applies to left projectile rack only.

C Remove two screws (4), two lockwashers (5) and two flat washers (6) that secure bracket (7) and spacer (8) to outside APU compartment wall. Discard lockwashers.

WARNING

Stand clear of projectile racks during removal from vehicle to prevent possible personal injury.

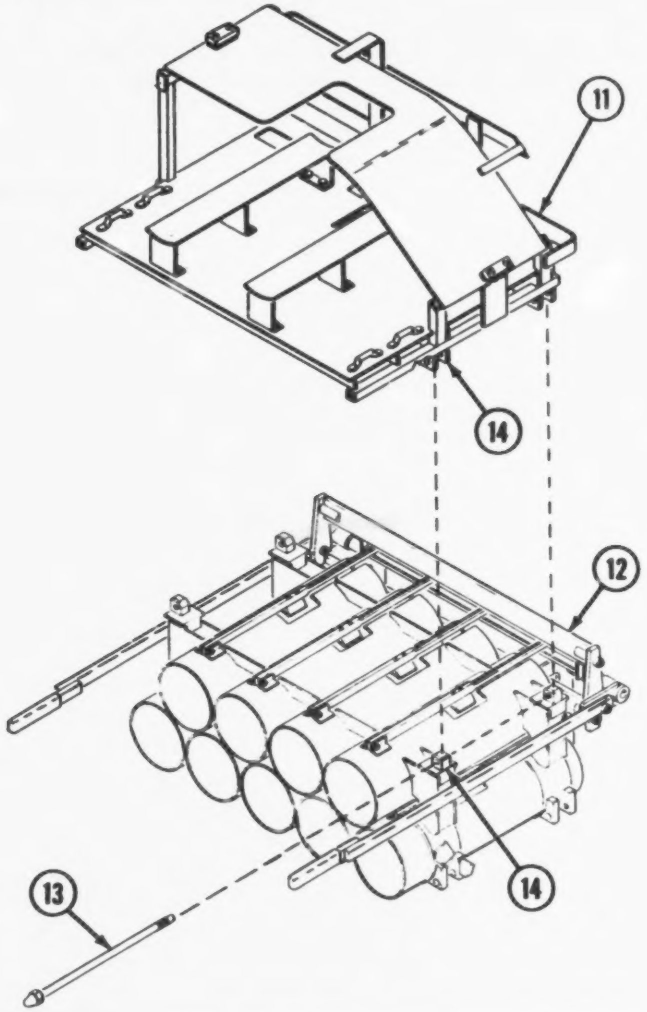
CAUTION

Place bottom two handles of each unit in up position before setting rack on flat surface to avoid equipment damage.

D Lift rack assembly from vehicle and place on a solid floor in a suitable work area for further disassembly. Remove lifting device.

TA57473

PROJECTILE RACK: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove stowage box (11) from top projectile rack (12) by unscrewing and removing two rods (13).

B Lift stowage box (11) from rack assembly.

NOTE

Note order of rack removal. Make sure racks are stacked in same order as removed to assure rack restraints will engage properly.

C Separate projectile racks (12) by removing two rods (13) from each rack (12).

ASSEMBLY

NOTE

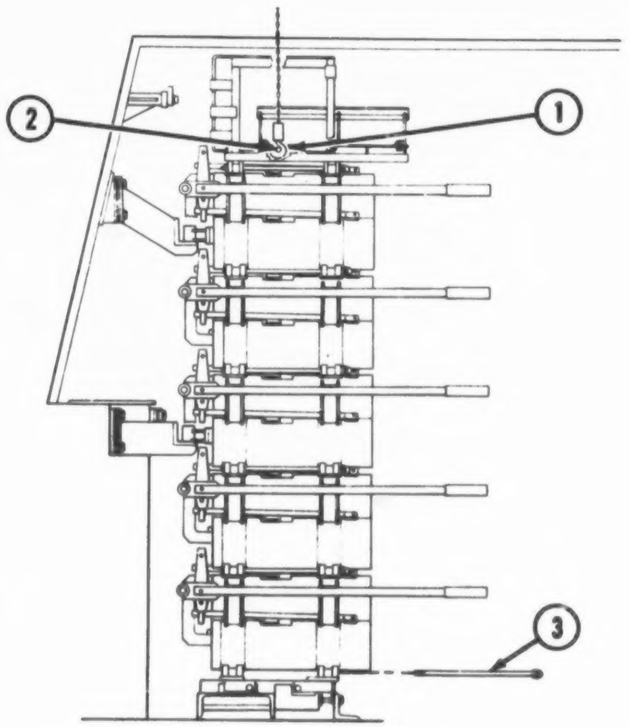
Make sure rack restraint is on third and fifth racks from bottom.

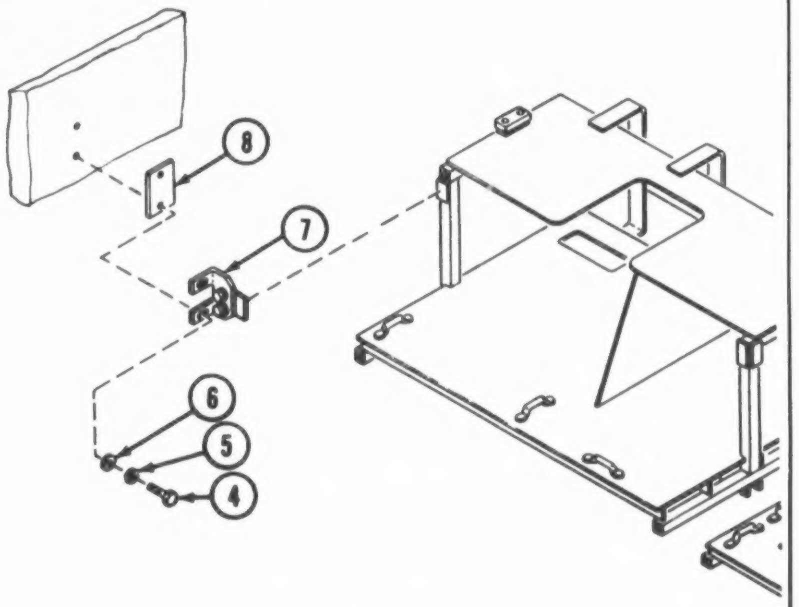
A Stack racks (12), making sure interlocking blocks (14) properly engage, and install two rods (13).

B Install stowage box (11) on top rack (12) and secure interlocking blocks (14) together with two rods (13).

TA57474

PROJECTILE RACK: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)





INSTALLATION

NOTE

Apply zinc chromate paste (item 46, Appx D) between all steel and aluminum mating surfaces.

A Install hook (1) on bar (2) of projectile rack assembly and use suitable lifting device to lift rack into vehicle.

NOTE

Step B applies to left projecitle rack only.

B Install bracket (7) and spacer (8) to outside APU compartment wall with two screws (4), two new lockwashers (5) and two flat washers (6).

C Install two rods (3). Tighten to 50 lb-ft.

D Remove lifting device.

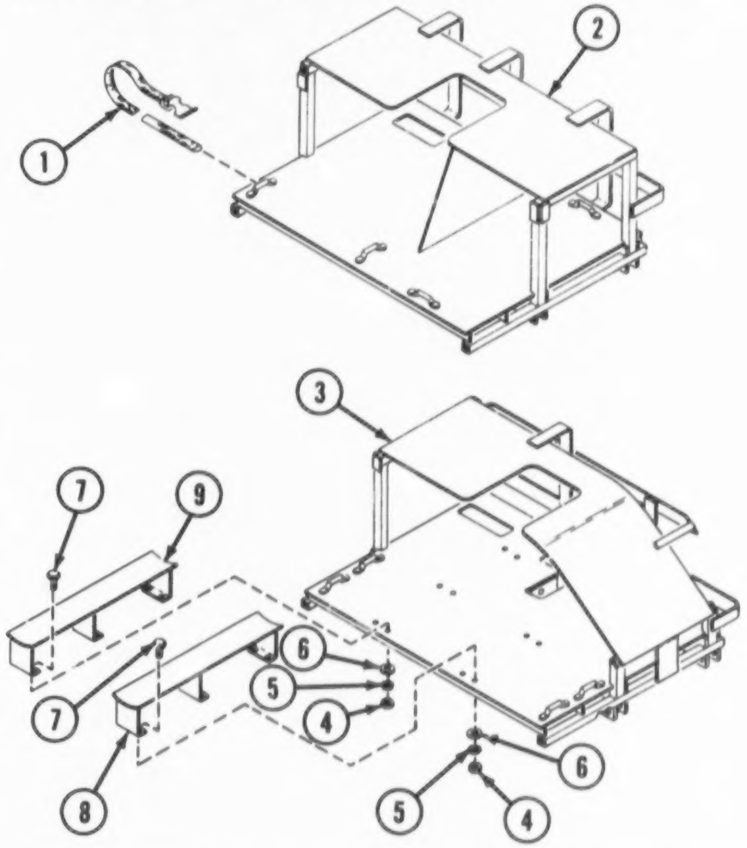
TA57475

PROJECTILE RACK CANISTER STOWAGE BOXES: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Equipment Condition:

Projectile rack assembly removed (p 11-5).



DISASSEMBLY

A Unbuckle and remove four straps (1) from two stowage boxes (2 and 3).

B Remove from right stowage box (3), 12 nuts (4), 12 flat washers (5), 12 lockwashers (6), 12 screws (7) and two trays (8 and 9). Discard lockwashers.

ASSEMBLY

A Install trays (8 and 9) in right stowage box (3) using six screws (7), six flat washers (5) six new lockwashers (6) and six nuts (4) on each tray.

B Install four straps (1) to stowage boxes (2 and 3).

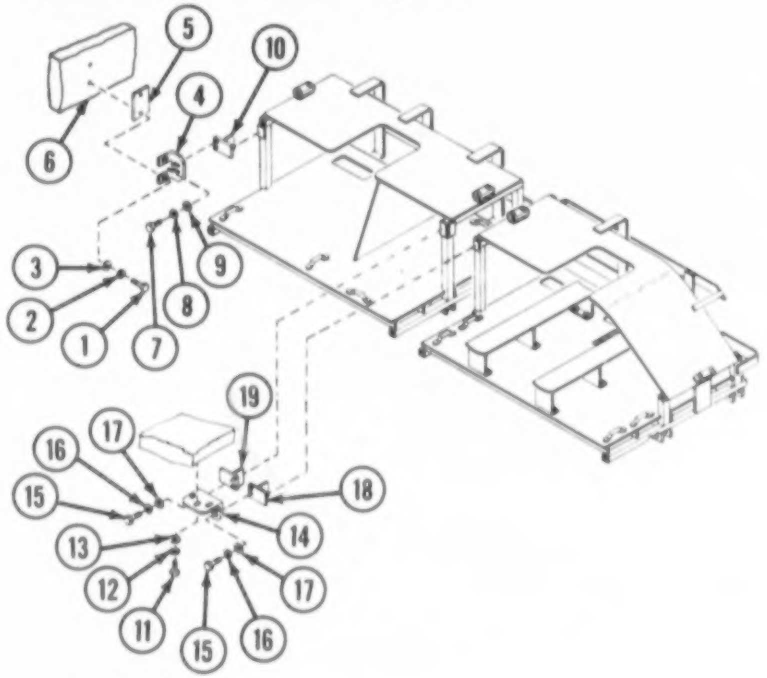
TA57476

PROJECTILE RACK ASSEMBLY BRACES: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Zinc chromate paste (item 46, Appx D).



REMOVAL

A Remove two screws (1), two lockwashers (2) and two flat washers (3), and remove angle (4) and spacer (5) from outside APU wall (6). Discard lockwashers.

B Remove two screws (7), two lockwashers (8) and two flat washers (9) and remove brace (10) from angle (4). Discard lockwashers.

C Remove three screws (11), three lockwashers (12) and three flat washers (13), and remove angle (14) from middle top door. Discard lockwashers.

D Remove four screws (15), four lockwashers (16) and four flat washers (17), and remove two braces (18 and 19) from angle (14). Discard lockwashers.

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between the following mating surfaces: spacer (5) and support angle (4); angle (14) and middle top door.

B Adjust braces (10, 18 and 19) to provide snug fit on projectile racks.

C Install two braces (18 and 19) on angle (14) using four screws (15), four new lockwashers (16) and four flat washers (17).

D Install angle (14) on middle top door using three screws (11), three new lockwashers (12), and three flat washers (13).

E Install brace (10) on angle (4) using two screws (7), two new lockwashers (8), and two flat washers (9).

F Install angle (4) and spacer (5) on APU wall (6) using two screws (1), two new lockwashers (2) and two flat washers (3).

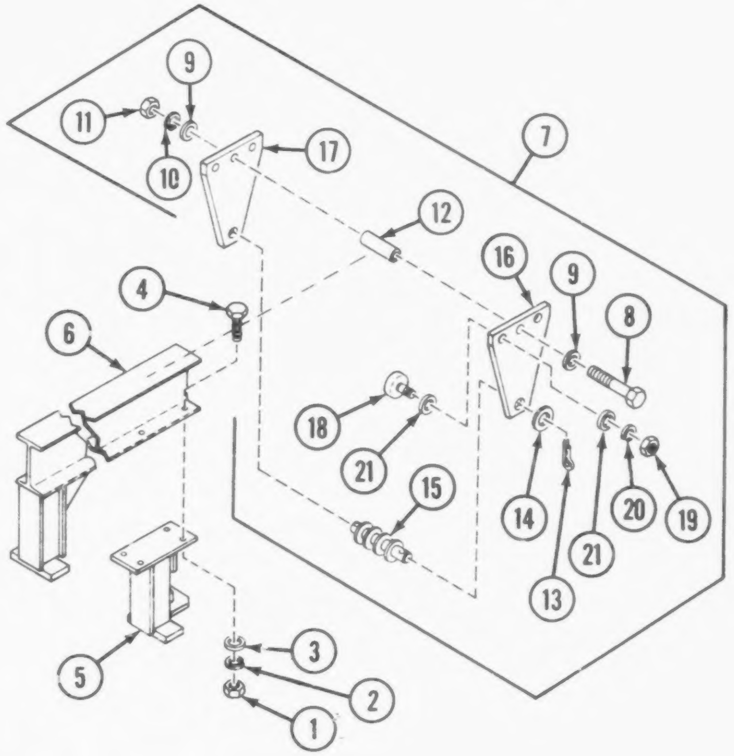
TA57477

PROJECTILE RACK REMOVAL AID: DISASSEMBLY, INSPECTION AND REPAIR, AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)



Materials/Parts:

Adhesive (item 4, Appx D)
Dry-cleaning solvent (item 20, Appx D)

References:

TM 9-214

DISASSEMBLY

A Remove four nuts (1), four lockwashers (2), four flat washers (3) and four screws (4) releasing extension (5) from beam (6). Discard lockwashers.

B Slide trolley assembly (7) from end of beam (6).

C Remove screw (8), two flat washers (9), lockwasher (10), nut (11) and spacer (12). Discard lockwasher.

D Remove two cotter pins (13) and two flat washers (14) from shaft (15), and separate plates (16 and 17). Discard cotter pins.

E Remove each of four cam followers (18) by removing nut (19), lockwasher (20) and two flat washers (21). Discard lockwasher.

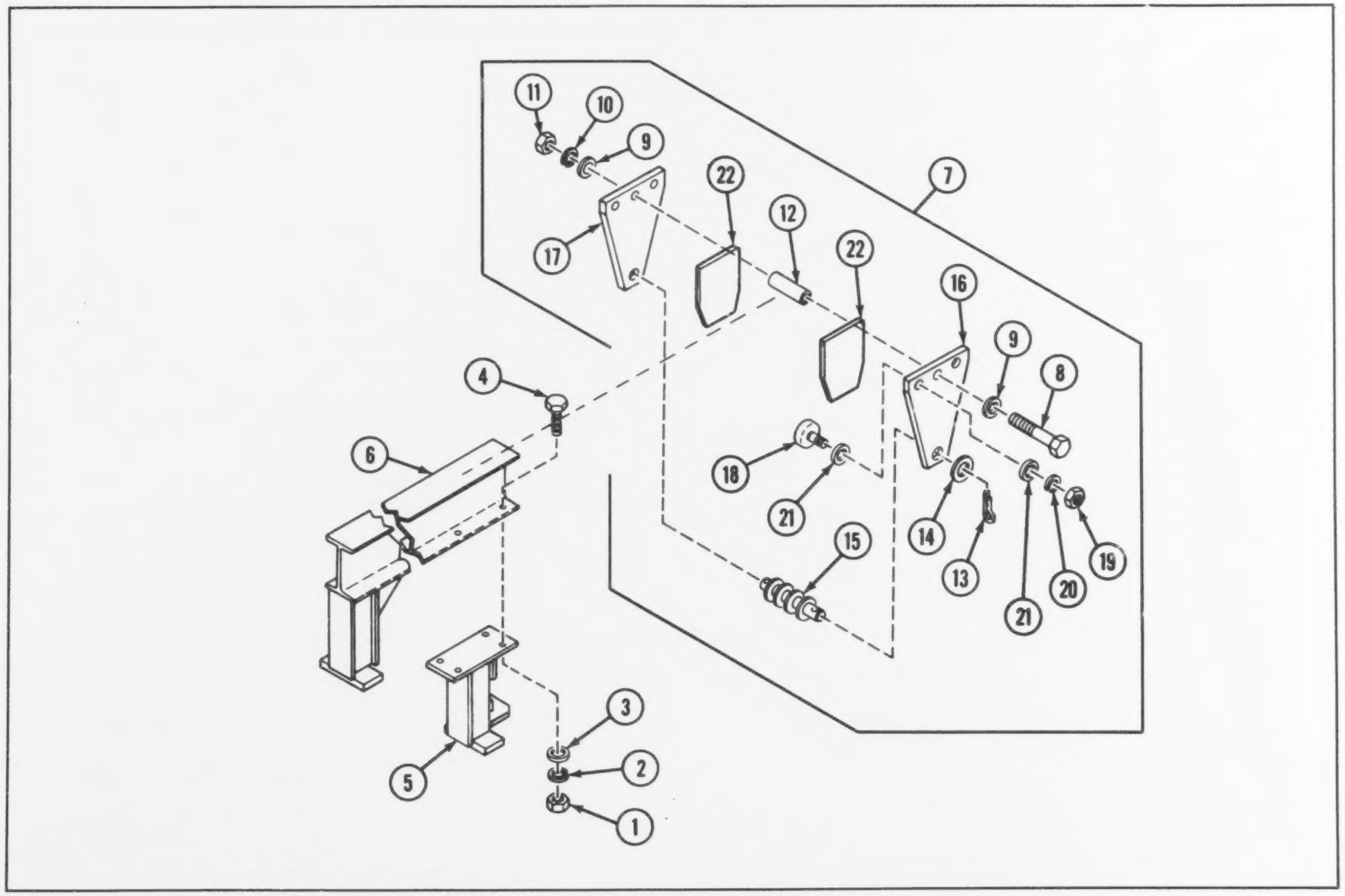
INSPECTION AND REPAIR

A Inspect shaft (15) extension (5), beam (6) and plates (16 and 17) for cracks, bends or damage. Replace defective parts.

B Inspect four cam followers (18) in accordance with TM 9-214.

TA57478

PROJECTILE RACK REMOVAL AID: DISASSEMBLY, REPAIR AND ASSEMBLY (CONTINUED)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TA313015

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100° F (38° C); for Type II it is 138° F (50° C). Do not use near open flame or excessive heat.

C Inspect nylon wear strips (22) for cracks, tears and gouges. If defective, remove from plate (16 or 17) with wire brush (item 48, Appx B) and dry-cleaning solvent (item 20, Appx D).

D Apply adhesive (item 4, Appx D) to rough side of new wear strip (22). Allow to dry until tacky (5 minutes). Press onto plate (16 or 17).

ASSEMBLY

A Install each of four cam followers (18) on plate (16 or 17) with two flat washers (21), new lockwasher (20) and nut (19).

B Install shaft (15) between plates (16 and 17) with two flat washers (14) and two new cotter pins (13).

C Connect plate (16), spacer (12) and plate (17) with screw (8), two flat washers (9), one new lockwasher (10) and nut (11).

D Slide trolley assembly (7) onto beam (6).

E Install extension (5) on beam (6) with four screws (4), four flat washers (3), four new lockwashers (2) and four nuts (1).

TA57479

Section II CANISTER COMPARTMENTS

RIGHT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION

REMOVAL

A Remove portable fire extinguisher and bracket from front of canister rack (p 10-7).

B Remove NBC hose and air outlet orifice connector (p 14-8).

C Remove AFES cylinder bottle No. 2 (p 14-28) and disconnect AFES harness wire secured to canister rack.

D Remove AFES cylinder bottle No. 2 bracket (p 14-30).

E Remove decontamination apparatus and bracket from front of canister rack (p 10-9).

F Remove all restraint bars and restraint straps (p 11-21).

G Remove two folding steps (1) from front post (2) by removing from each, two screws (3), two flat washers (4), two lockwashers (5) and two nuts (6).

H Remove three guides (7) from front post (2) and middle and top posts (8 and 9) by removing from each, four screws (10), four flat washers (11), four lockwashers (12) and four nuts (13).

I Remove three guides (14) from vehicle hull rear by removing from each, four screws (15), four flat washers (16) and four lockwashers (17).

J Remove top shelf (18) by removing four screws (19), four flat washers (20), four lockwashers (21) and four nuts (22).

K Remove angle (23) from vehicle hull rear by removing five screws (24), five flat washers (25) and five lockwashers (26).

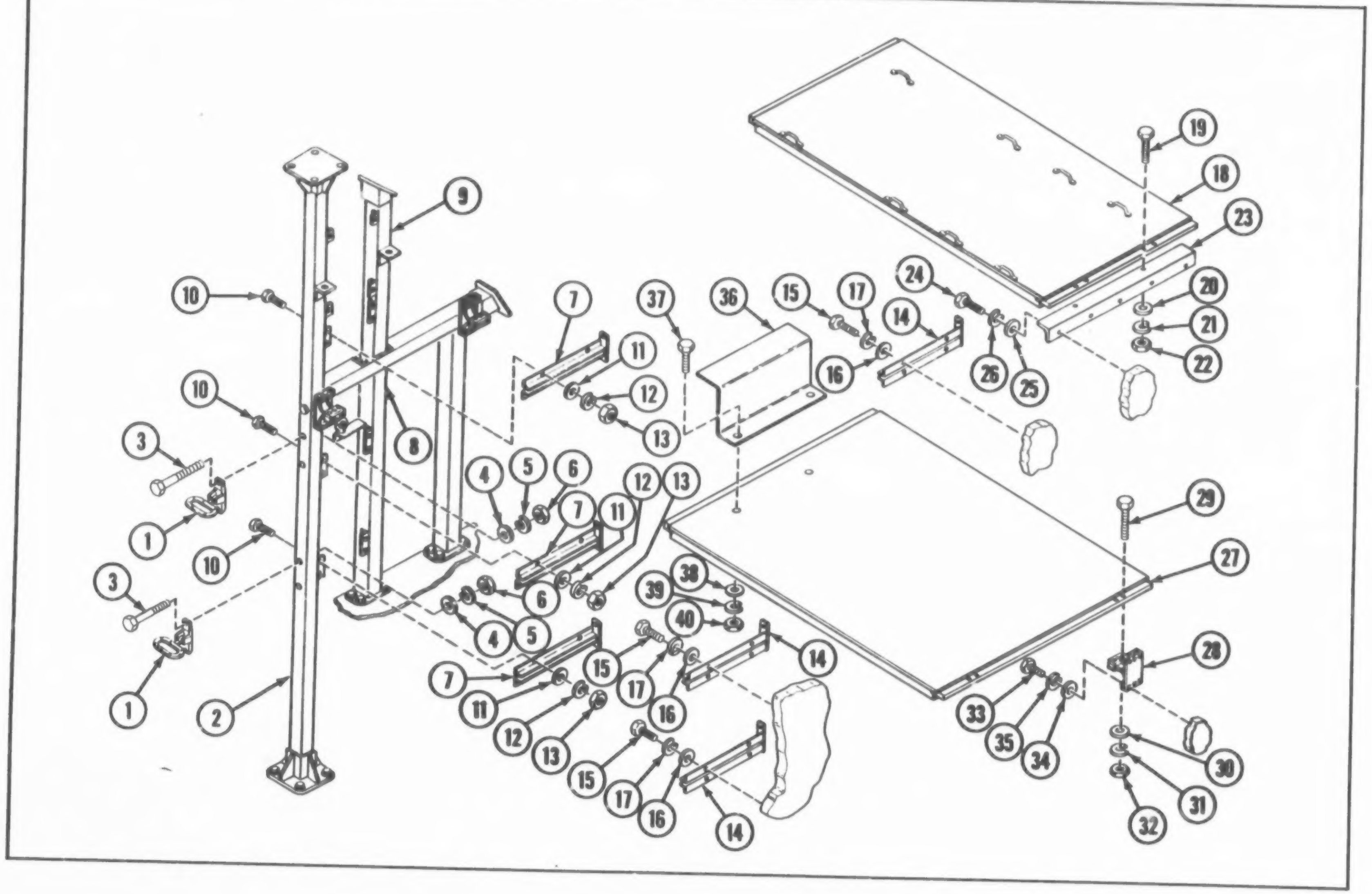
L Remove shelf (27) from isolators (28) by removing eight screws (29), eight flat washers (30), eight lockwashers (31) and eight nuts (32).

M Remove two isolators (28) from vehicle hull rear by removing from each, four screws (33), four flat washers (34) and four lockwashers (35).

N Remove angle (36) from shelf (27) by removing two screws (37), two flat washers (38), two lockwashers (39) and two nuts (40).

TA310188

RIGHT REAR CANISTER COMPARTMENT, SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)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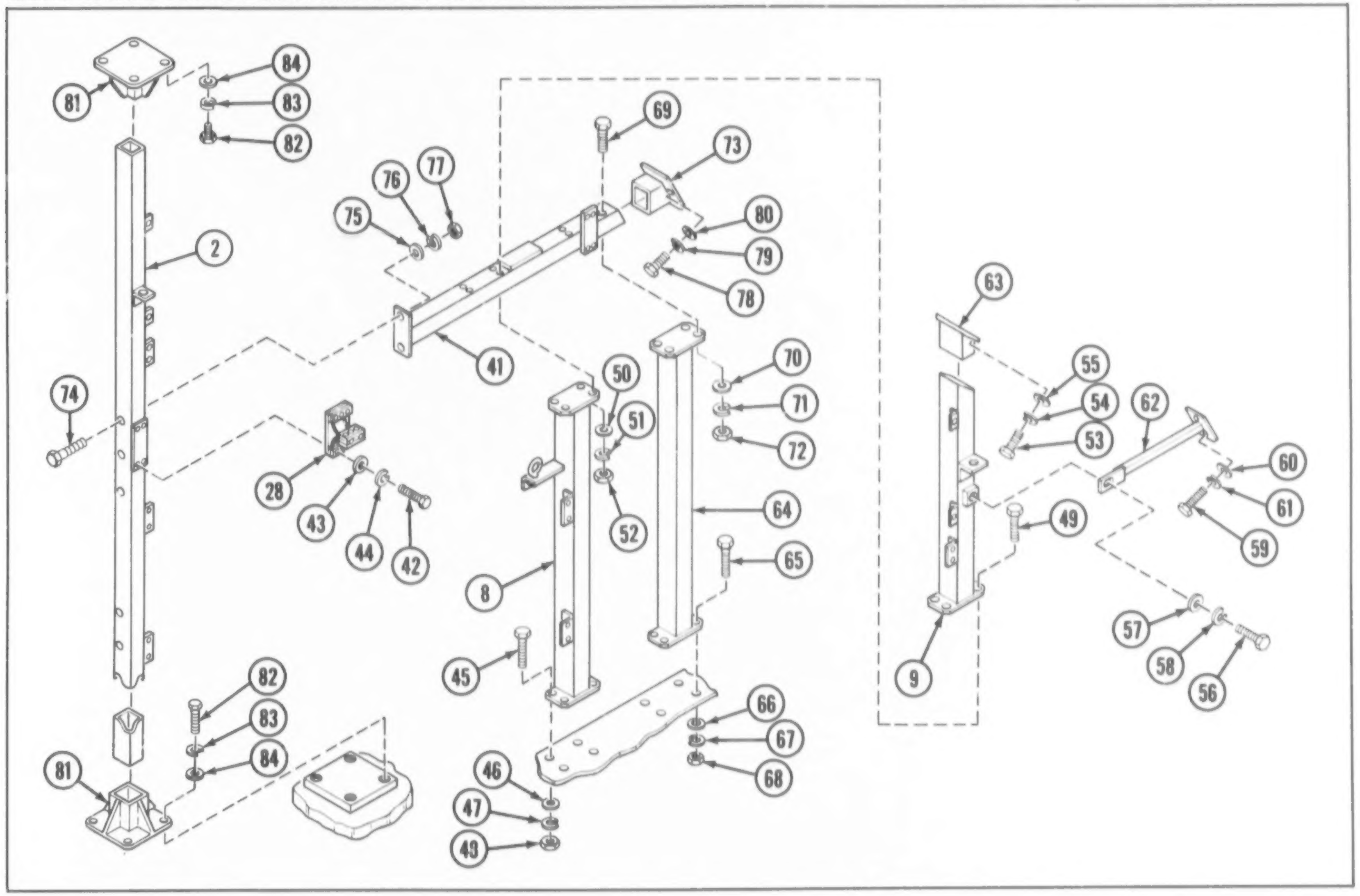
TA310189

RIGHT REAR CANISTER COMPARTMENT, SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)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TA310190

RIGHT REAR CANISTER COMPARTMENT, SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)

N Remove two isolators (28) from front post (2) and support (41) by removing from each, four screws (42), four flat washers (43) and four lockwashers (44).

O Remove middle post (8) by removing four screws (45), four flat washers (46), four lockwashers (47) and four nuts (48) at bottom, and four screws (49), four flat washers (50), four lockwashers (51) and four nuts (52) at top.

P Remove top post (9) by removing two screws (53), two lockwashers (54), two flat washers (55), screw (56), flat washer (57), lockwasher (58), two screws (59), two flat washers (60), two lockwashers (61) and bracket (62). Remove top post (9), and remove bracket (63) from vehicle ceiling.

Q Remove rear post (64) by removing four screws (65), four flat washers (66), four lockwashers (67) and four nuts (68) at bottom, and four screws (69), four flat washers (70), four lockwashers (71) and four nuts (72) at top.

R Remove support (41) from front post (2) and bracket (73) by removing one screw (74), one flat washer (75), one lockwasher (76) and one nut (77). Remove bracket (73) held by two screws (78), two lockwashers (79) and two flat washers (80). Remove support (41) from bracket (73).

S Remove front post (2) by removing two brackets (81) each held by four screws (82), four lockwashers (83) and four flat washers (84). Remove brackets (81) from front post (2).

INSTALLATION

A Apply zinc chromate paste (item 46, Appx D) between mating surfaces of canister rack and vehicle hull.

B Reverse order of removal procedures.

TA310191

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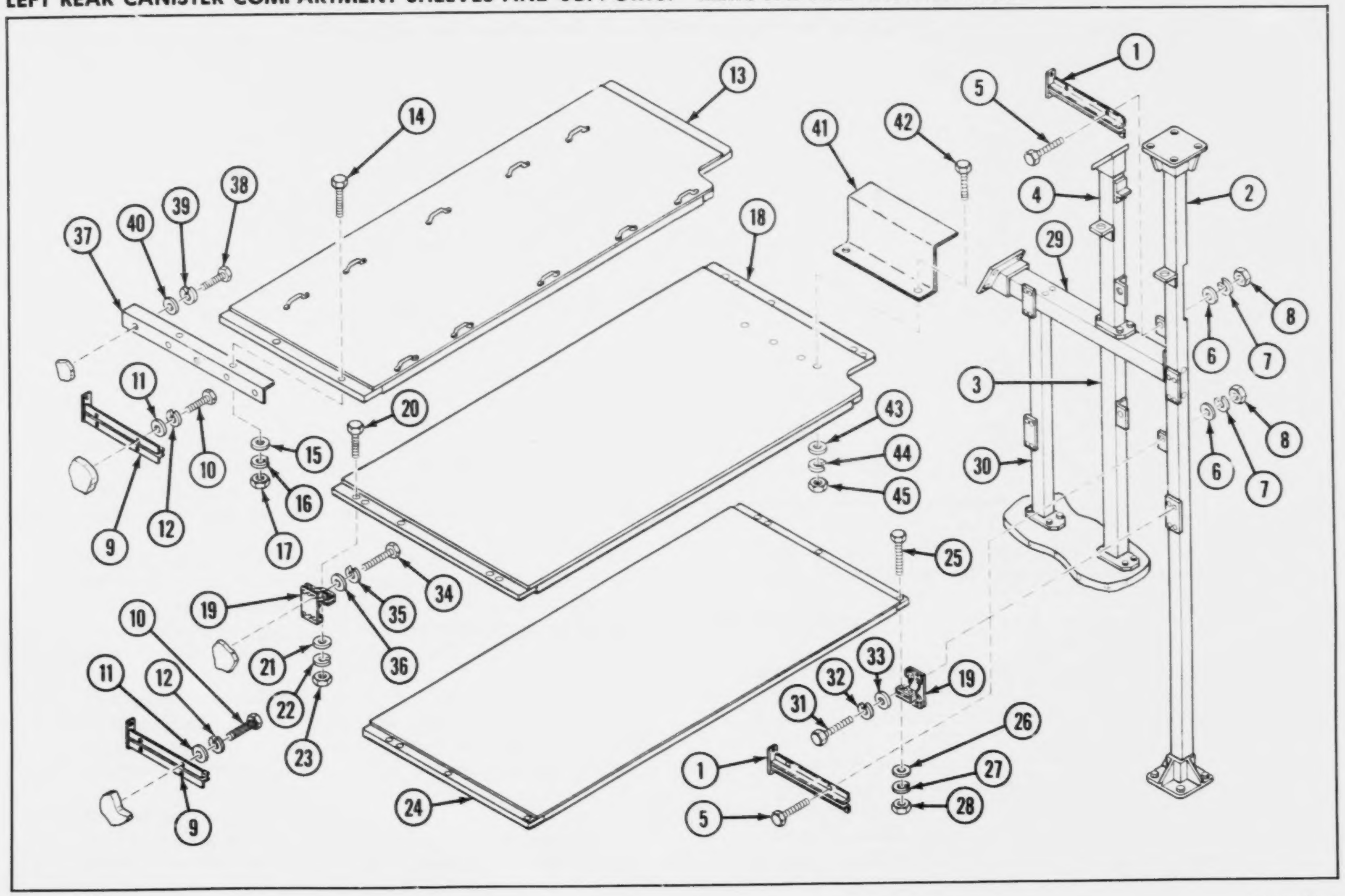
LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION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TA313017

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)

INITIAL SETUP

Materials/Parts

Zinc chromate paste (Item 46, Appx D)

Personnel Required

Two

Equipment Condition:

Crew seat removed (p 9-16).
Ventilated facepiece hose guard removed (p 14-3).
Stacker bar removed (p 12-45).
All restraint bars and restraint straps removed (p 11-22.1).

REMOVAL

WARNING

Before conducting any repairs, make sure that propellant charges and any powder pellets are removed from work area. Failure to do so may result in death or injury of personnel.

A Disconnect VFP hoses.

B Remove two guides (1) from front post (2) and middle and top posts (3 and 4) by removing four screws (5), four flat washers (6), four lockwashers (7) and four nuts (8) from each guide. Discard lockwashers.

C Remove two guides (9) from vehicle hull rear by removing four screws (10), four flat washers (11) and four lockwashers (12) from each guide. Discard lockwashers.

D Remove top shelf (13) by removing four screws (14), four flat washers (15), four lockwashers (16) and four nuts (17). Discard lockwashers.

E Remove shelf (18) from isolators (19) by removing eight screws (20), eight flat washers (21), eight lockwashers (22) and eight nuts (23). Discard lockwashers.

F Remove shelf (24) from isolators (19) by removing eight screws (25), eight flat washers (26), eight lockwashers (27) and eight nuts (28). Discard lockwashers.

G Remove four isolators (19) from front post (2), support (29) and rear post (30) by removing from each, four screws (31), four lockwashers (32) and four flat washers (33). Discard lockwashers.

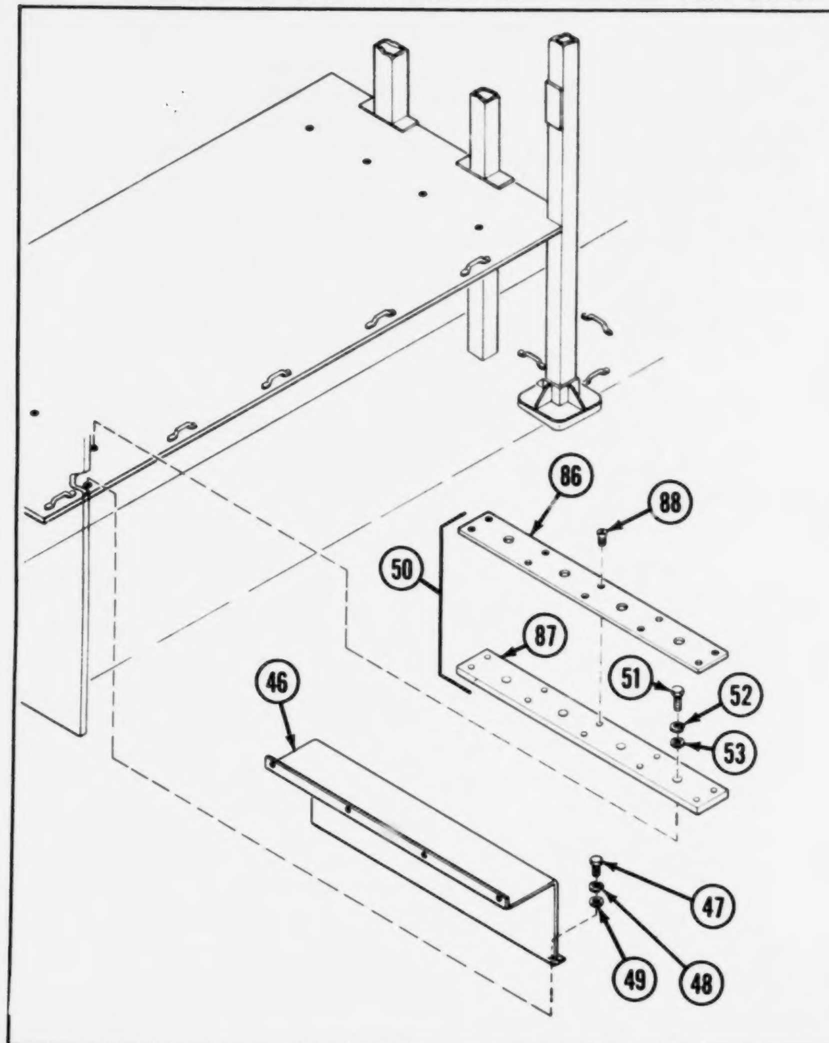
H Remove four isolators (19) from vehicle hull rear by removing four screws (34), four lockwashers (35) and four flat washers (36) from each isolator (19).

I Remove angle (37) from hull by removing five screws (38), five lockwashers (39) and five flat washers (40). Discard lockwashers.

J Remove angle (41) from shelf (18) by removing two screws (42), two flat washers (43), two lockwashers (44) and two nuts (45). Discard lockwashers.

TA313018

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)



K Remove guard (46) by removing eight screws (47), eight lockwashers (48) and eight flat washers (49). Discard lockwashers.

L Remove two wear strip assemblies (50) by removing four screws (51), four lockwashers (52) and four flat washers (53) from each assembly. Discard lockwashers.

M Remove middle post (3) by removing four screws (54), four flat washers (55), four lockwashers (56) and four nuts (57) at bottom, and four screws (58), four flat washers (59), four lockwashers (60) and four nuts (61) at top. Discard lockwashers.

N Remove top post (4) by removing two screws (62), two lockwashers (63), two flat washers (64). Remove top post (4), and remove bracket (65) from vehicle ceiling. Discard lockwashers.

O Remove rear post (30) by removing four screws (66), four flat washers (67), four lockwashers (68) and four nuts (69) at bottom, and four screws (70), four flat washers (71), four lockwashers (72) and four nuts (73) at top. Discard lockwashers.

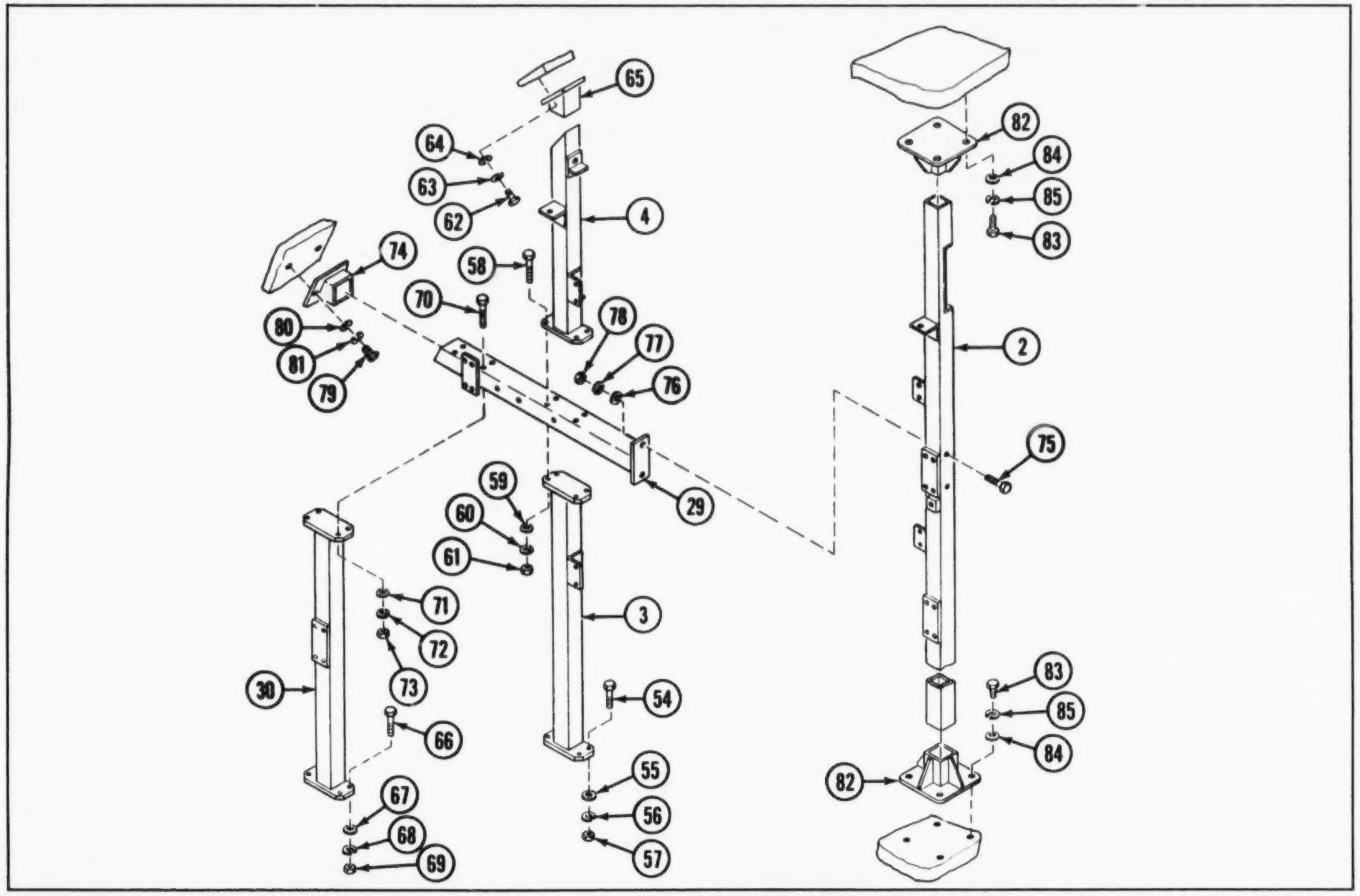
P Remove support (29) from front post (2) and bracket (74) by removing two screws (75), two flat washers (76), two lockwashers (77) and two nuts (78). Remove bracket (74) held by two screws (79), two flat washers (80) and two lockwashers (81). Remove support (29) from bracket (74). Discard lockwashers.

Q Remove front post (2) by removing two brackets (82) each held by four screws (83), four flat washers (84) and four lockwashers (85). Remove brackets (82) from front post (2). Discard lockwashers.

R Remove wear strips (86) from supports (87) by removing 10 screws (88).

TA313019

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)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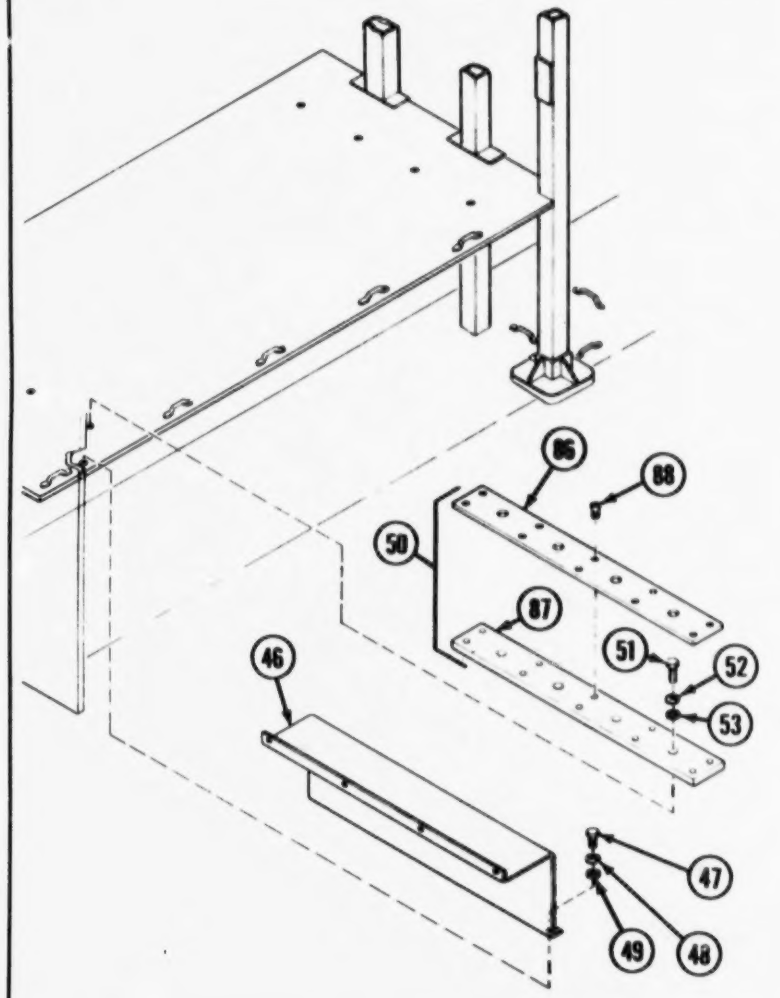
TA313020

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTE

Apply zinc chromate paste (item 46, Appx D) between mating surfaces of steel rack supports, brackets and vehicle hull.

A Install wear strip (86) to supports (87) with 10 screws (88).

B Install two brackets (82) on front post (2). Install two brackets (82) and post (2) with eight screws (83), eight flat washers (84) and eight new lockwashers (85).

C Install support (29) in bracket (74). Install bracket (74) with two screws (79), two flat washers (80) and two new lockwashers (81). Install support (29) on front post (2) with two screws (75), two flat washers (76), two new lockwashers (77) and two nuts (78).

D Install rear post (30) by installing four screws (66), four flat washers (67), four new lockwashers (68) and four nuts (69) at bottom and four screws (70), four new lockwashers (72), four flat washers (71) and four nuts (73) at top.

E Install top post (4) by installing two screws (62), two new lockwashers (63), two flat washers (64) and bracket (65) to vehicle ceiling.

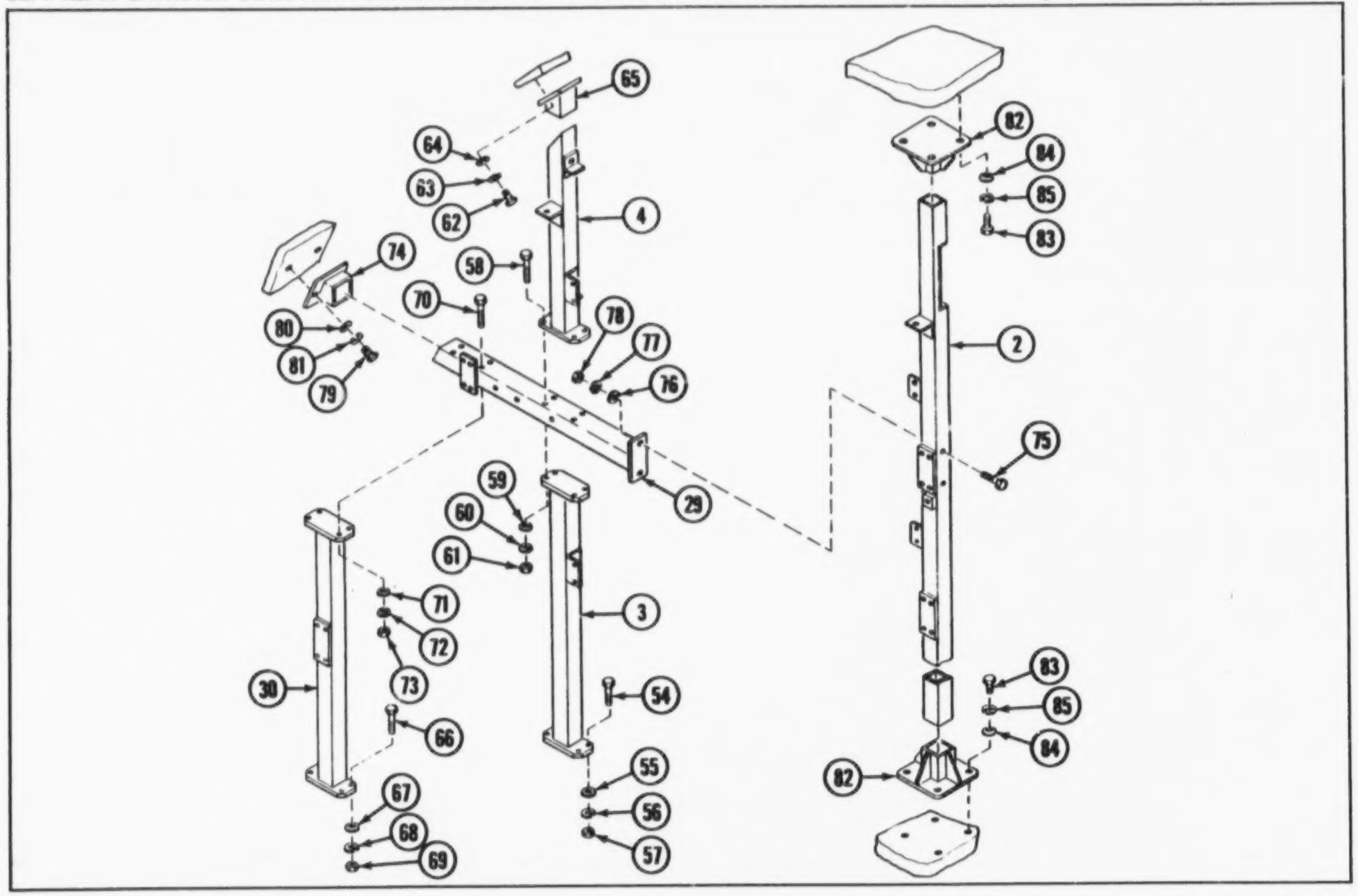
F Install middle post (3) by installing four screws (54), four flat washers (55), four new lockwashers (56) and four nuts (57) at bottom and four screws (58), four flat washers (59), four new lockwashers (60) and four nuts (61) at top.

G Install wear strip assemblies (50) to bottom shelf by installing four screws (51), four new lockwashers (52) and four flat washers (53) in each assembly.

H Install guard (46) by installing eight screws (47), eight new lockwashers (48) and eight flat washers (49).

TA313021

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)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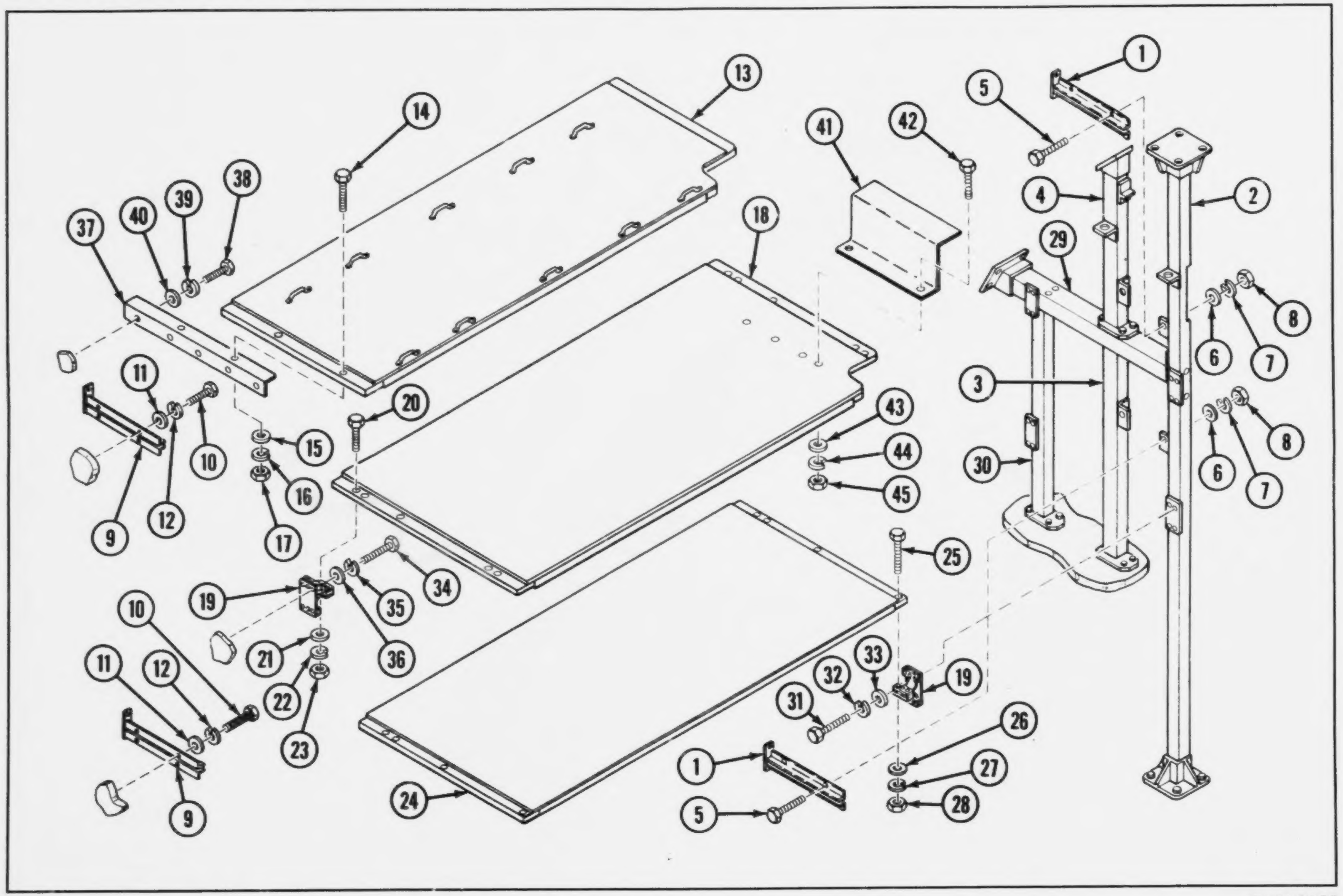
TA313022

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION (CONTINUED)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TA313023

LEFT REAR CANISTER COMPARTMENT SHELVES AND SUPPORTS: REMOVAL AND INSTALLATION

I Install angle (41) to shelf (18) by installing two screws (42), two flat washers (43), two new lockwashers (44) and two nuts (45).

J Install angle (37) to hull by installing five screws (38), five new lockwashers (39) and five flat washers (40).

K Install four isolators (19) to vehicle hull rear by installing four screws (34), four new lockwashers (35) and four flat washers (36) to each isolator (19).

L Mount four isolators (19) to front post (2), support (29) on rear post (30) installing in each, four screws (31), four new lockwashers (32) and four flat washers (33).

M Mount shelf (24) to isolators (19) by installing eight screws (25), eight flat washers (26), eight new lockwashers (27) and eight nuts (28).

N Mount shelf (18) to isolators (19) by installing eight screws (20), eight flat washers (21), eight new lockwashers (22) and eight nuts (23).

O Mount top shelf (13) by installing four screws (14), four flat washers (15), four new lockwashers (16) and four nuts (17).

P Mount two guides (9) to vehicle hull rear by installing four screws (10), four flat washers (11) and four new lockwashers (12).

Q Mount two guides (1) to front post (2), middle post (3) and top post (4) by installing four screws (5), four flat washers (6), four new lockwashers (7) and four nuts (8) to each.

R Connect VFP hoses.

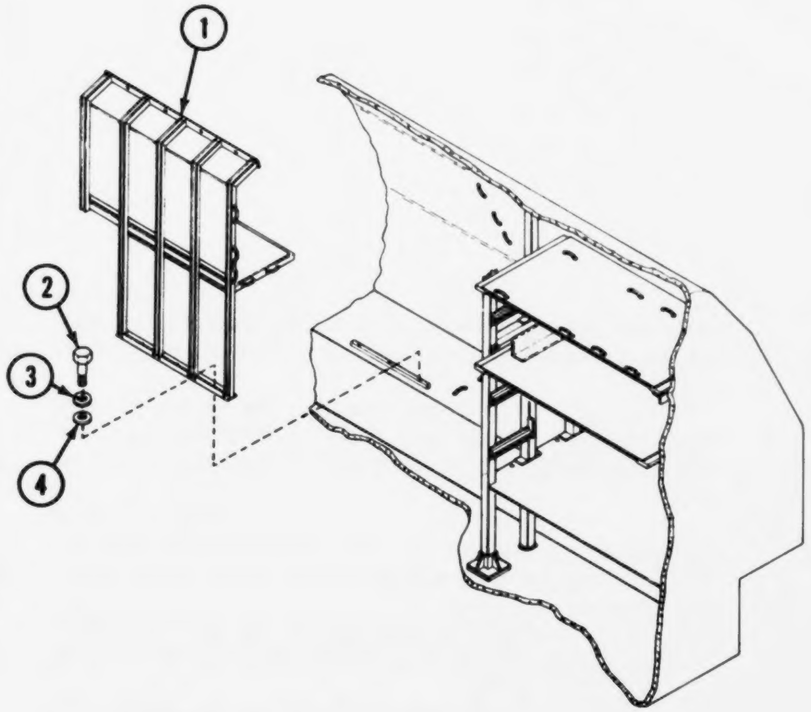
TA313024

RIGHT FRONT CANISTER COMPARTMENT SHELF ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Right projectile rack removed (p 11-5).
Canister rack restraint straps removed (p 11-21).



REMOVAL

Remove shelf assembly (1) from right front side of vehicle by removing 10 screws (2), 10 lockwashers (3) and 10 flat washers (4). Discard lockwashers.

INSTALLATION

Install shelf assembly (1) to right front side of vehicle using 10 flatwashers (4), 10 new lockwashers (3) and 10 screws (2).

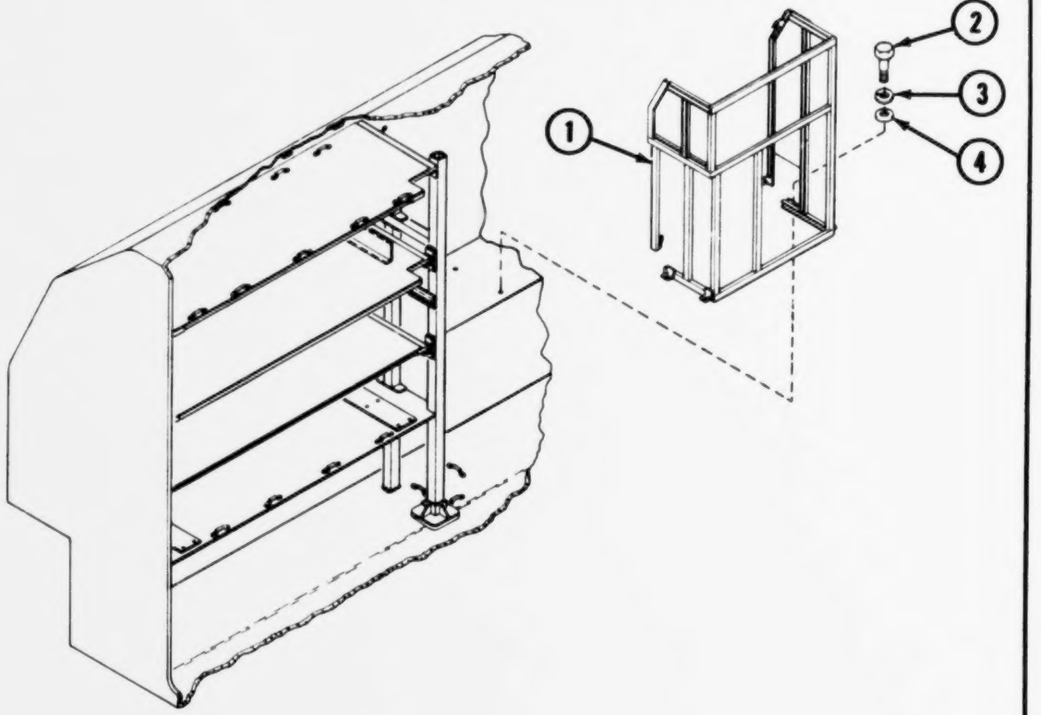
TA57267

LEFT FRONT CANISTER COMPARTMENT SHELF ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Canister rack restraint straps removed (p 11-22.1).



REMOVAL

Remove shelf assembly (1) from left front side of vehicle by removing eight screws (2), eight lockwashers (3) and eight flat washers (4). Discard lockwashers.

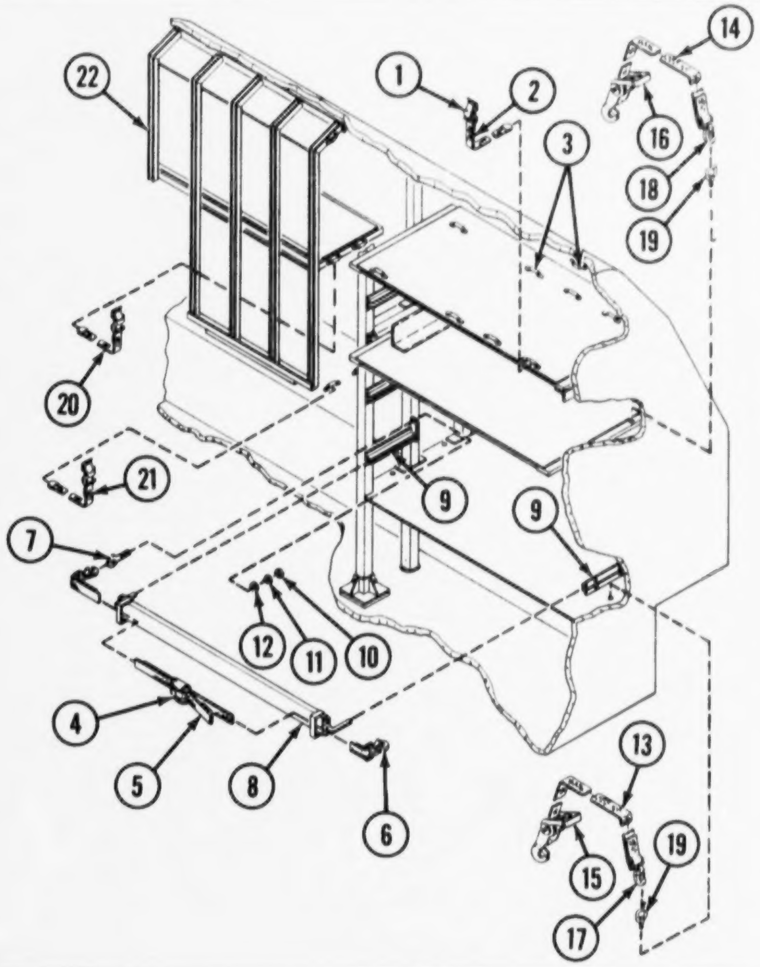
INSTALLATION

Install shelf assembly (1) to left front side of vehicle by installing eight flat washers (4), eight new lockwashers (3) and eight screws (2).

TA57291

Section III CANISTER RESTRAINTS

CANISTER RESTRAINTS (RIGHT SIDE): REMOVAL AND INSTALLATION



REMOVAL

A Release spring-action buckle (1) from clip end of four straps (2). Grasp buckle (1) and pull each strap through upper rack and vehicle-mounted fasteners (3).

B Pull release plate of three buckles (4) to loosen three restraint straps (5), and unhook six snap hooks (6) from six eyebolts (7).

C Slide three bar assemblies (8), with three attached restraint straps (5), from bar slide tracks (9), and rmove from rack assembly. See p 11-23 for removal of restraint straps (5).

D Remove six nuts (10), six lockwashers (11), six flat washers (12) and six eyebolts (7) from rack assembly. Discard lockwashers.

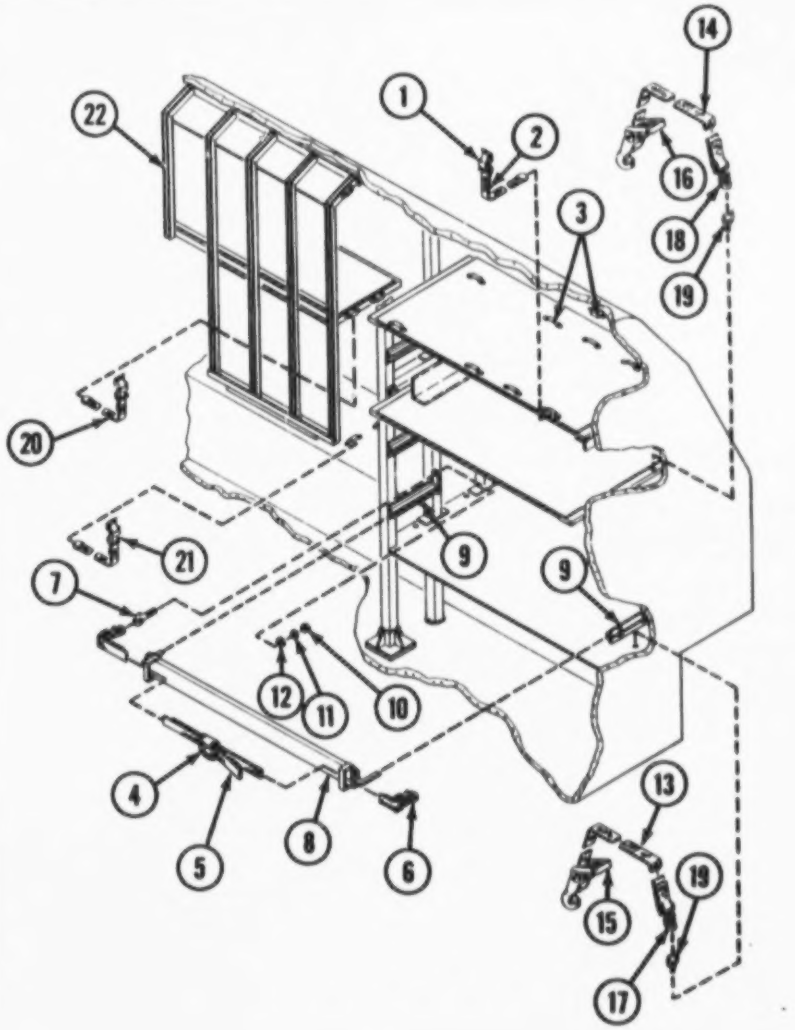
E Release tension of two strap assemblies (13) and strap assembly (14) by releasing two ratchet buckle assemblies (15) and ratchet buckle assembly (16). Unhook three ratchet buckles (15 and 16) and three snap hooks (17 and 18) from six strap studs (19). Remove strap assemblies from rack.

F Unscrew and remove six strap studs (19) by turning counterclockwise.

G Unbuckle and remove two strap assemblies (20) and two strap assemblies (21) from right front canister compartment (22).

TA57456

CANISTER RESTRAINTS (RIGHT SIDE): REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install and buckle two strap assemblies (20) and two strap assemblies (21) on right front canister compartment (22).

B Install six strap studs (19) by turning clockwise.

C Hook three snap hooks (17 and 18) and three ratchet buckles (15 and 16) to six strap studs (19). Secure three ratchet buckle assemblies (15 and 16).

D Install six eyebolts (7) on rack assembly with six flat washers (12), six new lockwashers (11) and six nuts (10).

E Install restraint straps (5) on bar assemblies (8) (p 11-23).

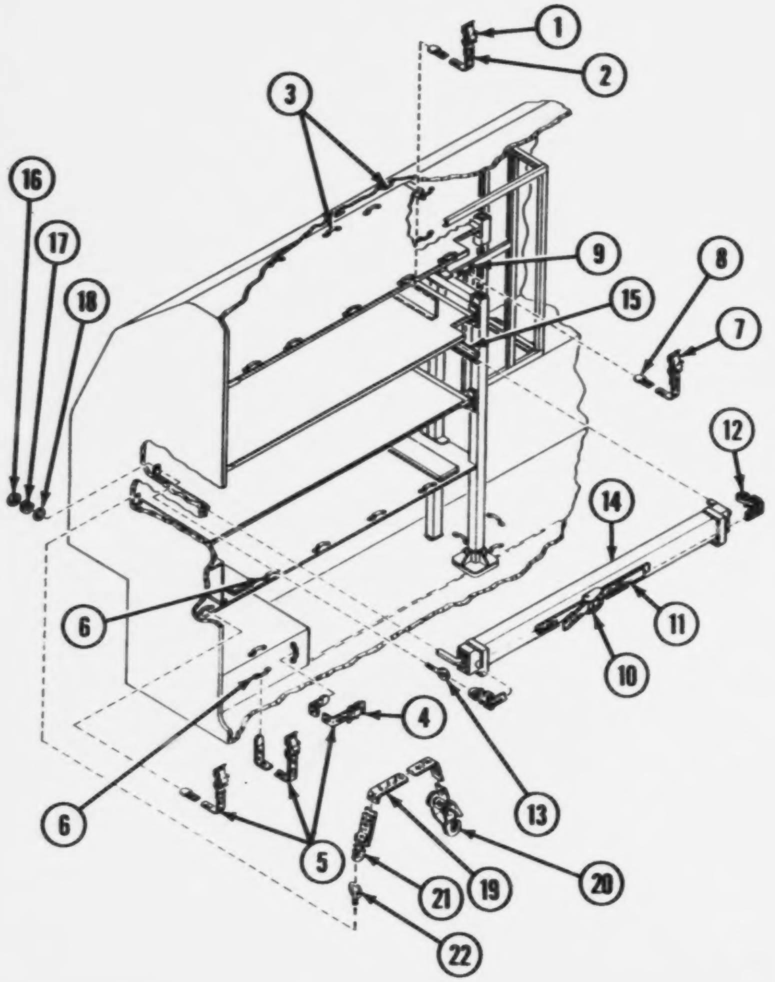
F Slide three bar assemblies (8), with attached restraint straps (5) onto bar slide tracks (9).

G Hook six snap hooks (6) to six eyebolts (7) and tighten three restraint straps (5) by pushing release plate of three buckles (4).

H Insert clip end of four straps (2) through upper rack and vehicle-mounted fasteners (3) and secure spring action buckle (1).

TA57457

CANISTER RESTRAINTS (LEFT SIDE): REMOVAL AND INSTALLATION



REMOVAL

A Release spring action buckle (1) from clip end of five straps (2). Grasp buckle (1) and pull each strap through upper rack and vehicle-mounted fasteners (3).

B Release spring action buckle (4) from clip end of seven straps (5). Grasp buckle (4) and pull each strap through lower rack and vehicle-mounted fasteners (6).

C Release spring action buckle (8) from clip end of two straps (8). Grasp buckle (7) and pull each strap through rack and vehicle-mounted fasteners (9).

D Pull release plate of two buckles (10) to loosen two straps (11), and unhook four snap hooks (12) from four eyebolts (13).

E Slide two bar assemblies (14), with two attached straps (11), from bar slide tracks (15), and remove from rack assembly. See p 11-23 for removal of restraint straps (11).

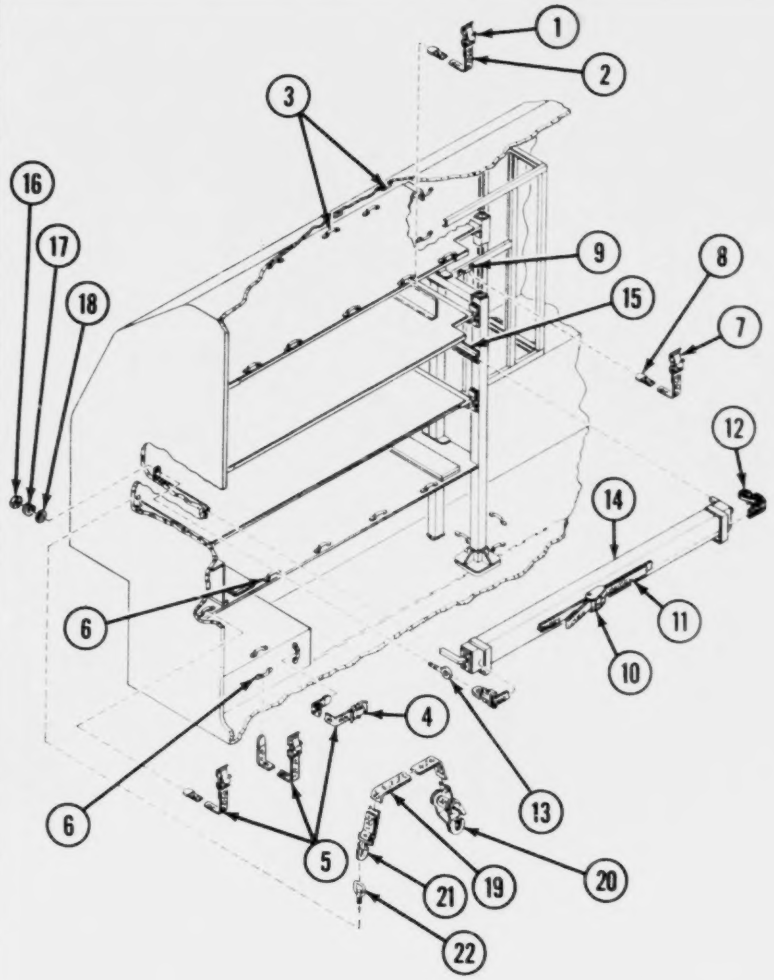
F Remove four nuts (16), four lockwashers (17), four flat washers (18) and four eyebolts (13) from rack assembly. Discard lockwashers.

G Release tension of two strap assemblies (19) by releasing two ratchet buckle assemblies (20). Unhook two ratchet buckles (20) and two snap hooks (21) from four strap studs (22). Remove strap assemblies from the rack.

H Remove four strap studs (22) by turning out counterclockwise.

TA313029

CANISTER RESTRAINTS (LEFT SIDE): REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install four strap studs (22) by turning clockwise.

B Hook two ratchet buckles (20) and two snap hooks (21) on four strap studs (22). Secure ratchet buckle assemblies (20).

C Install four eyebolts (13) on rack assembly with four flat washers (18), four new lockwashers (17) and four nuts (16).

D Install restraint straps (11) on bar assemblies (14) (p 11-23).

E Slide two bar assemblies (14), with two attached straps (11), onto bar slide tracks (15).

F Hook four snap hooks (12) onto four eyebolts (13) and tighten two straps (11) by pushing release plate of two buckles (10).

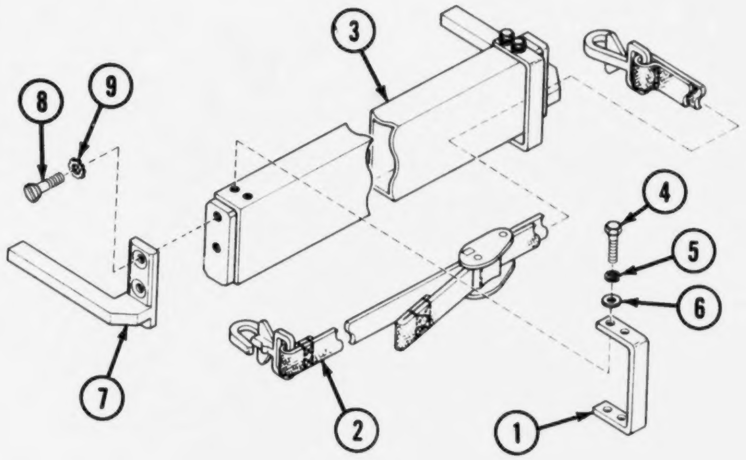
G Insert clip end of two straps (8) through rack and vehicle-mounted fasteners (9) and secure spring action buckles (7).

H Insert clip end of seven straps (5) through lower rack and vehicle-mounted fasteners (6) and secure spring action buckles (4).

I Insert clip end of five straps (2) through upper rack and vehicle-mounted fasteners (3) and secure spring action buckles (1).

TA313030

CANISTER COMPARTMENT RESTRAINT BAR ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

NOTE

These procedures apply to both ends of right and left rear compartment restraint bar assemblies.

A Remove two fasteners (1) and restraint strap (2) from bar assembly (3) by removing from each, four screws (4), four lockwashers (5) and four flat washers (6). Discard lockwashers.

B Remove two slides (7) from bar assembly (3) by removing from each, two screws (8) and two lockwashers (9). Discard lockwashers.

ASSEMBLY

A Install two slides (7) on bar assembly (3) using two screws (8) and two new lockwashers (9) for each slide.

B Install restraint strap (2) and two fasteners (1) on bar assembly (3), using four screws (4), four new lockwashers (5) and four flat washers (6) for each fastener.

TA313031

CHAPTER 12
AMMUNITION HANDLING EQUIPMENT (AHE) MAINTENANCE PROCEDURES

CHAPTER OVERVIEW

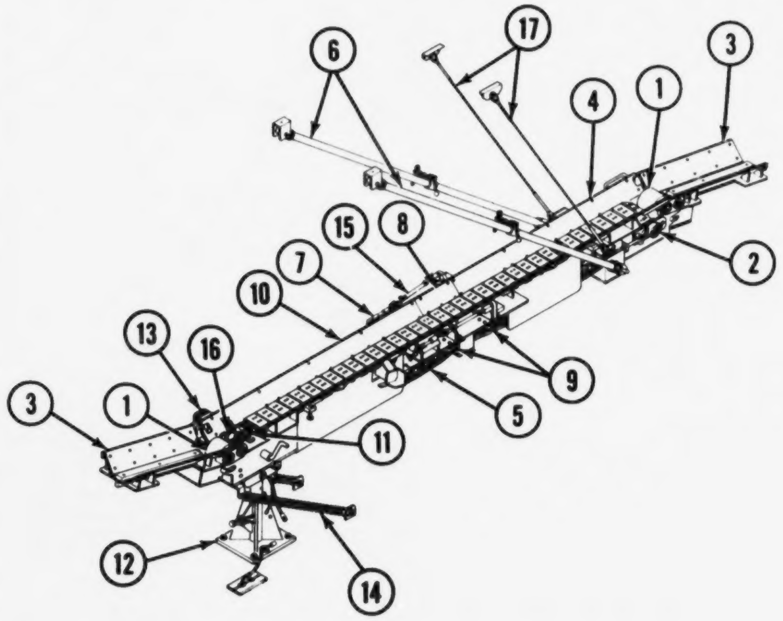
This chapter illustrates and describes procedures for removal, disassembly, assembly and installation of the M992 ammunition handling equipment (AHE) consisting of conveyor and stacker assemblies.

Lubrication requirements and procedures are defined in LO 9-2350-267-12.

This chapter contains the following sections:

Section I Conveyor Assembly
Section II Stacker Assembly

Section I CONVEYOR ASSEMBLY

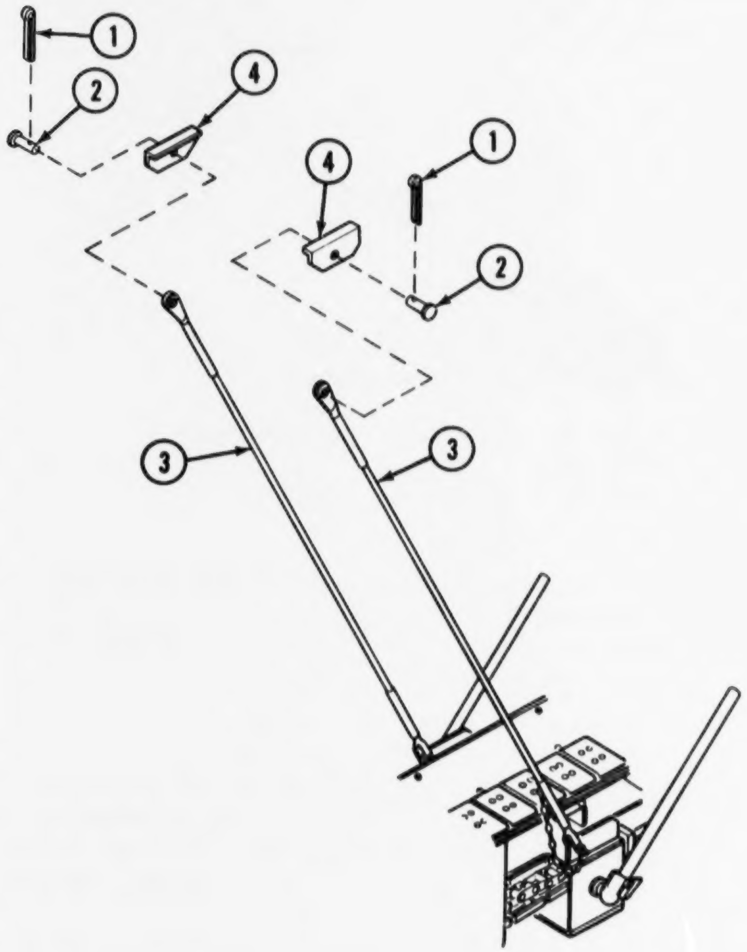


LEGEND

1 Roller assembly
2 Idler sprocket assembly
3 Dead-end section assembly (2)
4 Take-up section assembly
5 Chain assembly
6 Support assembly (2)
7 Toggle clamp assembly (2)
8 Center section assembly
9 Hinge assembly (4)
10 Drive-end section assembly
11 Drive sprocket assembly
12 Conveyor Stand
13 Hydraulic motor
14 Spring (2)
15 Tube assembly (2)
16 Coupling sprocket
17 Cable assembly (2)

TA310201

CONVEYOR SUPPORT CABLES: REMOVAL AND INSTALLATION



NOTE

This procedure, for both conveyor support cables, is performed with conveyor fully deployed (TM-9-2350-267-10).

REMOVAL

A Lower upper rear door to 45-degree stop (TM 9-2350-267-10).

B Remove locking pin (1) from pin (2).

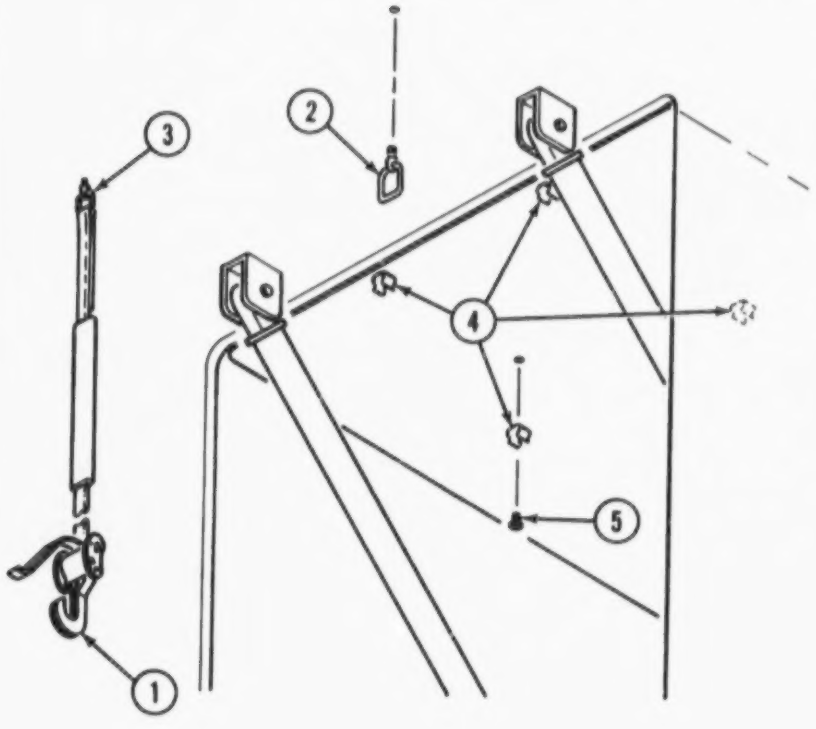
C Release upper end of cable (3) by removing pin (2) from door bracket (4).

INSTALLATION

Reverse order of removal procedures.

TA310202

CONVEYOR SUPPORT STRAP ASSEMBLY AND CABLE SUPPORT CLIPS: REMOVAL AND INSTALLATION



REMOVAL

A Unhook strap assembly hook (1) from strap stud (2).

B Turn strap stud (2) counterclockwise and remove from ceiling of vehicle.

C Turn strap stud (3) with attached strap assembly (1) counterclockwise, and remove from ceiling of vehicle.

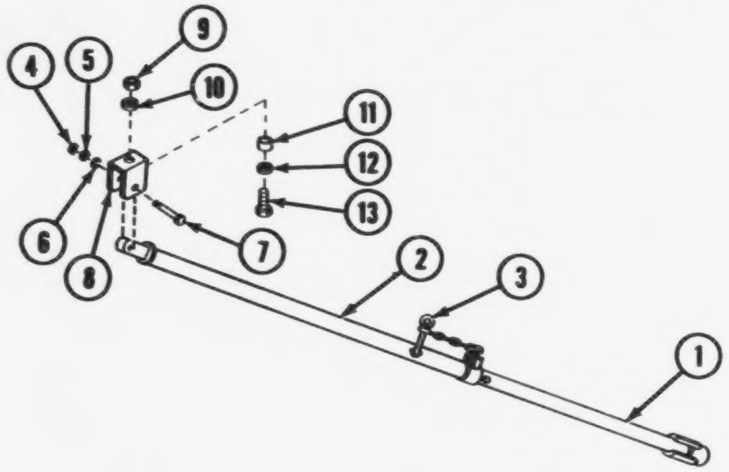
D Remove four cable support clips (4) from upper rear door of vehicle by removing one screw (5) from each.

INSTALLATION

Reverse order of removal procedures.

TA310203

CONVEYOR SUPPORTS AND CONVEYOR SUPPORT BRACKETS: REMOVAL AND INSTALLATION



WARNING

Do not attempt to remove conveyor supports while conveyor is in deployed position. Make sure conveyor is in stowed position (TM 9-2350-267-10).

NOTE

This procedure applies to both conveyor supports and brackets.

REMOVAL

A Slide lower support (1) into upper support (2) and secure with quick-release pin (3).

B While helper holds support (2), remove nut (4), lockwasher (5), flat washer (6) and screw (7).

C Remove upper and lower supports (1 and 2) as an assembly from vehicle.

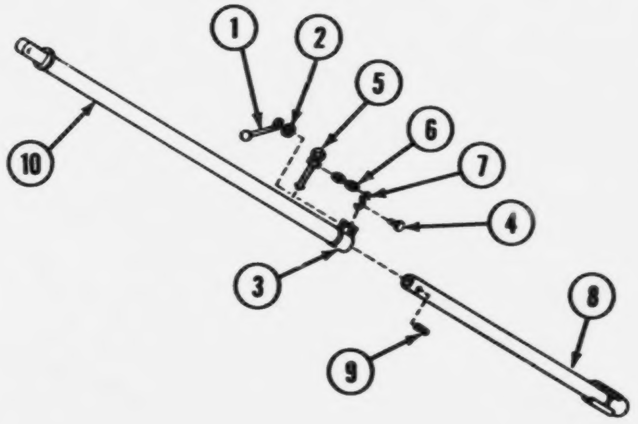
D Remove conveyor support bracket (8) by removing nut (9) lockwasher (10), spacer (11), flat washer (12) and screw (13) from vehicle roof.

INSTALLATION

Reverse order of removal procedures.

TA310204

UPPER SUPPORT, QUICK-RELEASE PIN AND HANDLE: REMOVAL AND INSTALLATION



REMOVAL

NOTE

The following procedure applies to both conveyor support assemblies.

A Turn support locking handle (1) counter-clockwise and remove handle (1) and washer (2) from collar (3).

B Remove screw (4), quick-release pin (5), chain (6), and S-hook (7) from collar (3).

C Extend lower support section (8) and turn to aline spring pin (9) with hole in upper support section (10); punch out spring pin (9) and separate support sections.

D Remove chain (6) from quick-release pin (5) by bending open S-hook (7) at chain end.

E Remove S-hook (7) from chain (6) by bending open the S-hook.

INSTALLATION

A Attach S-hook (7) to chain (6) by bending S-hook closed.

B Attach other end of chain (6) to quick-release pin (5) by bending closed the S-hook (part of 5).

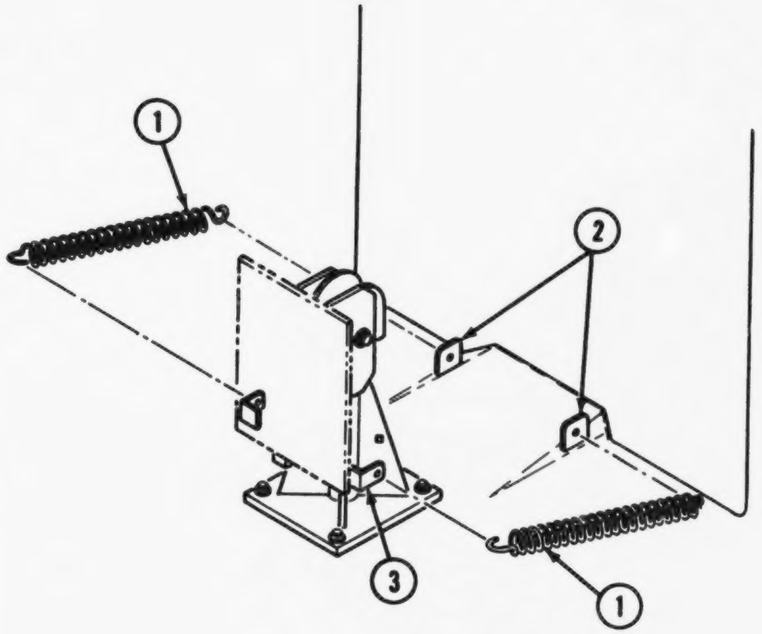
C Slide end of lower support section (8) into upper support section (10) and aline pin holes. Install spring pin (9) in lower support section (8).

D Install quick-release pin (5), chain (6), and S-hook (7) on collar (3) using screw (4).

E Install washer (2) and support locking handle (1) on collar (3).

TA57458

CONVEYOR SPRINGS: REMOVAL AND INSTALLATION



REMOVAL

NOTE

This procedure applies to both springs.

A Place conveyor in stowed position.

WARNING

Use care when stretching and relieving spring tension to avoid pinching hands in spring coils.

B With one person pulling spring toward rear of vehicle, another person must twist spring (1) to unhook from floor brackets (2).

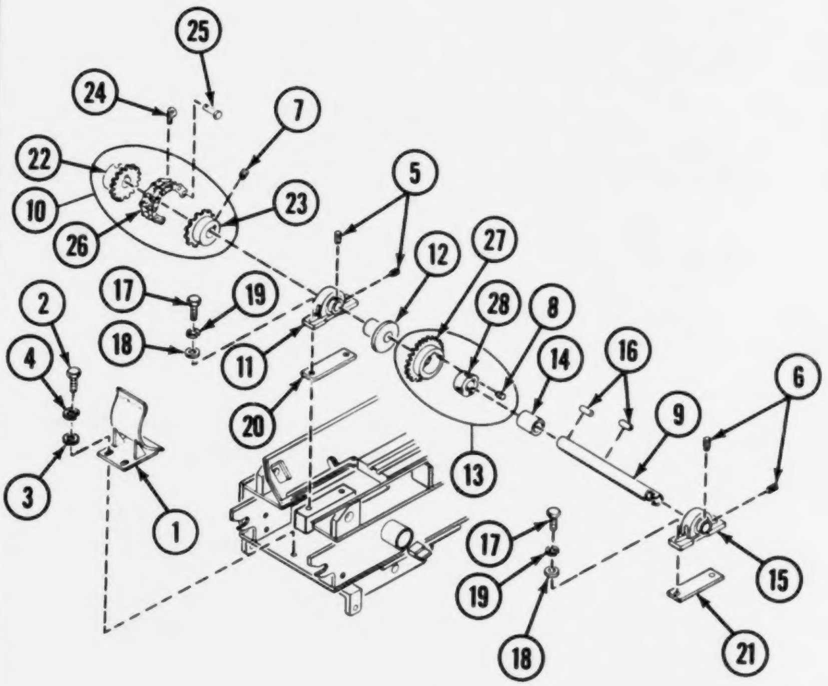
C Remove spring (2) from conveyor-mounted bracket (3).

INSTALLATION

Reverse removal instructions.

TA310206

DRIVE-END SECTION COUPLING SPROCKET, PILLOW BLOCKS AND DRIVE SPROCKET ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Remove conveyor chain (TM 9-2350-267-10).

B Remove conveyor hydraulic motor from conveyor assembly drive-end mounting plate (p 12-29).

C Remove conveyor drive-end section roller assembly (p 12-9).

D Remove chain guard (1) from conveyor drive-end section by removing two screws (2), two flat washers (3) and two lockwashers (4).

E Loosen two setscrews (5), two setscrews (6), setscrew (7) and remove two locking screws (8).

F Using drift pin, drive shaft (9) from motor mount side through sprocket assembly (10), pillow block (11), spacer (12), sprocket assembly (13), spacer (14) and pillow block (15), and remove shaft (9).

G Remove sprocket assembly (10), spacer (12), sprocket assembly (13) and spacer (14) from conveyor assembly.

H Remove two keys (16) from shaft (9).

I From each of two pillow blocks (11 and 15), remove two screws (17), two flat washers (18) and two lockwashers (19). Remove pillow blocks (11 and 15) from conveyor assembly.

J Remove shims (20 and 21).

K Separate sprocket halves (22 and 23) by removing cotter pin (24), pin (25) and coupling chain (26).

L Separate sprocket (27) from hub (28).

TA310207

DRIVE-END SECTION COUPLING, SPROCKET, PILLOW BLOCKS AND DRIVE SPROCKET ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Assemble sprocket (27) on hub (28) and install two locking screws (8). Do not tighten locking screw (8).

B Secure two sprocket halves (22 and 23) together with coupling chain (26). Install pin (25) through master link of coupling chain (26) and secure with cotter pin (24).

C Position shims (20 and 21) on pillow block mounts in conveyor assembly.

D Install two pillow block assemblies (11 and 15) on shims (20 and 21) and secure each with two flat washers (18), two lockwashers (19) and two screws (17).

E Install shaft (9) through pillow block (15). While driving shaft into assembly, install in order: one spacer (14), one key (16) installed in shaft keyway, sprocket assembly (13), and spacer (12). Drive shaft (9) partly through pillow block (11). Do not drive shaft completely through pillow block.

F Install one key (16) in keyway of coupling sprocket assembly (10). Position coupling sprocket assembly (10) to receive shaft (9) and drive shaft through sprocket assembly (10).

G Make sure sprocket (27) is alined with center of conveyor assembly, and tighten two locking screws (8).

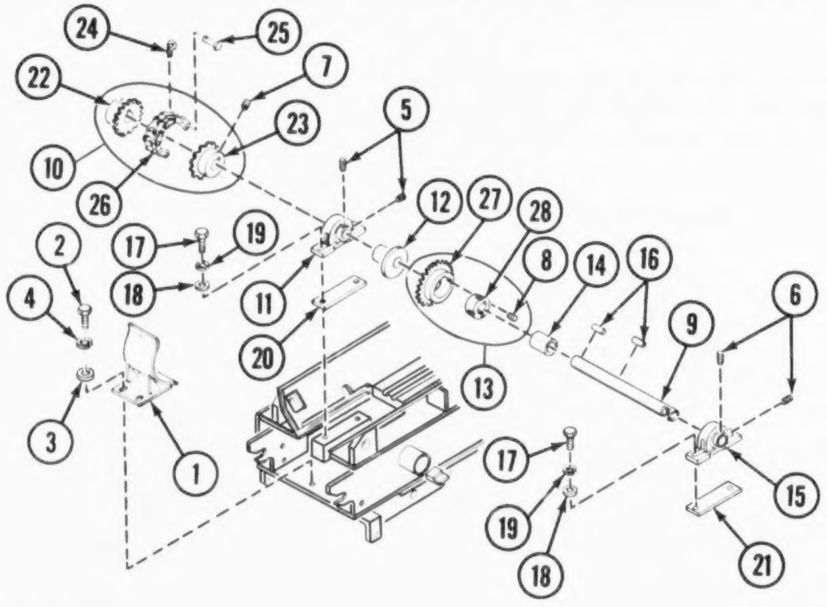
H Tighten setscrews (5, 6 and 7).

I Install chain guard (1) in conveyor assembly and secure with two flat washers (3), two lockwashers (4) and two screws (2).

J Install conveyor drive-end section roller assembly (p 12-9).

K Install conveyor hydraulic motor on drive-end section of conveyor assembly (p 12-29).

L Install conveyor chain (TM 9-2350-267-20).



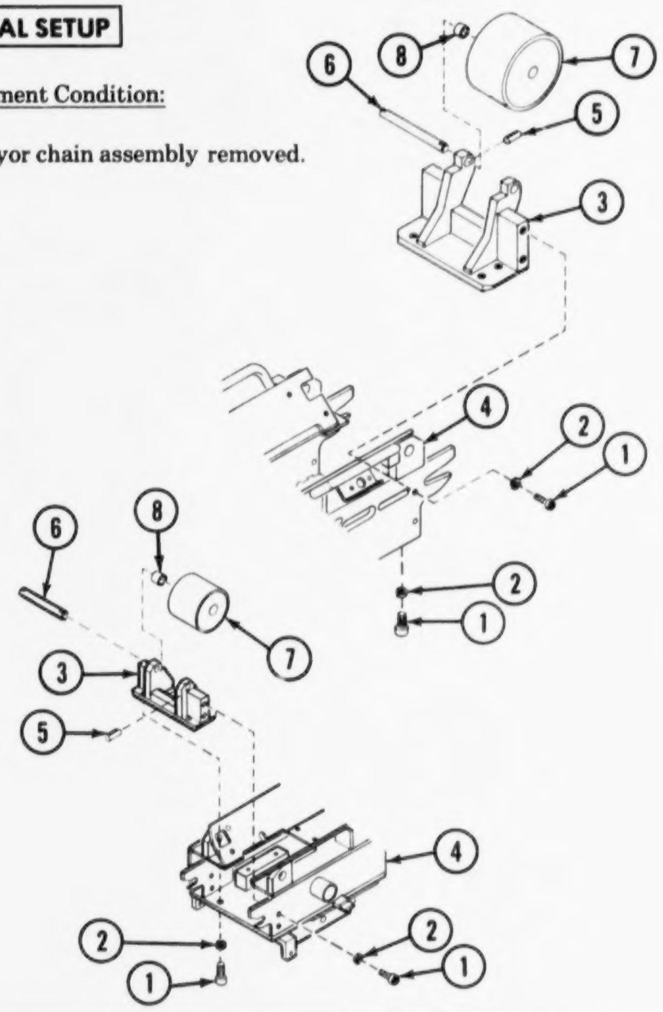
TA310208

ROLLER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Conveyor chain assembly removed.



REMOVAL

NOTE

> This procedure applies to roller assemblies in both drive-end and take-up end conveyor sections.

A Fold up conveyor dead-end sections to gain access to roller assembly.

B Remove eight screws (1) and eight lockwashers (2) and remove roller bracket (3) from conveyor assembly (4). Discard lockwashers.

DISASSEMBLY

A Drive out spring pins (5) from roller shaft (6) and bracket (3) using punch and hammer. Discard spring pins.

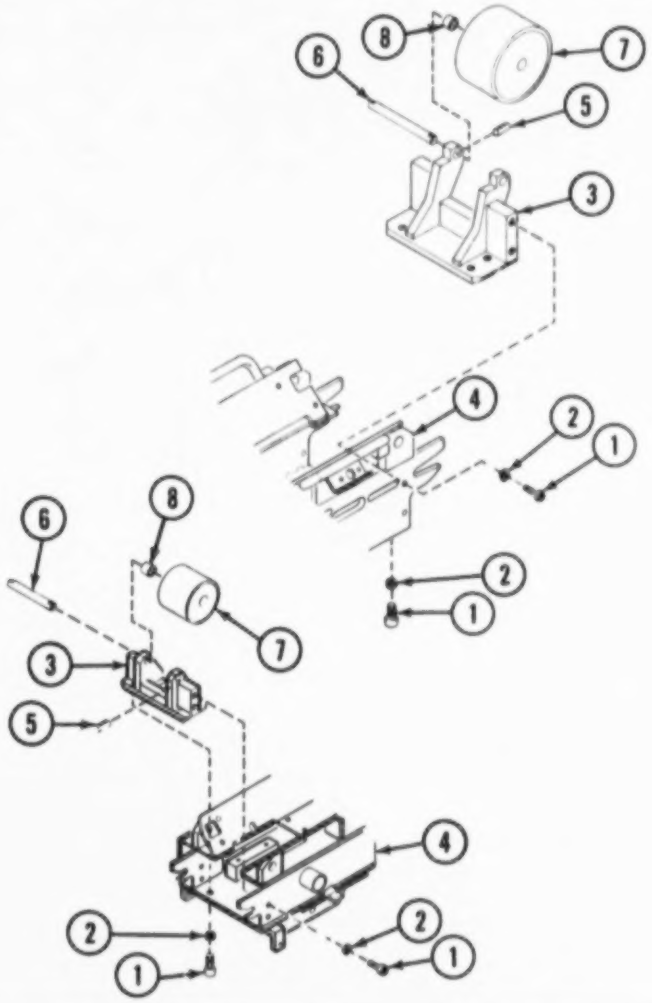
B Drive roller shaft (6) through bracket (3) and roller (7).

C Remove shaft (6) and roller (7).

D Remove two bearing sleeves (8) from roller (7).

TA313032

ROLLER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Install two bearing sleeves (8) in roller (7).

B Install roller (7) on bracket (3) with shaft (6) and new spring pins (5).

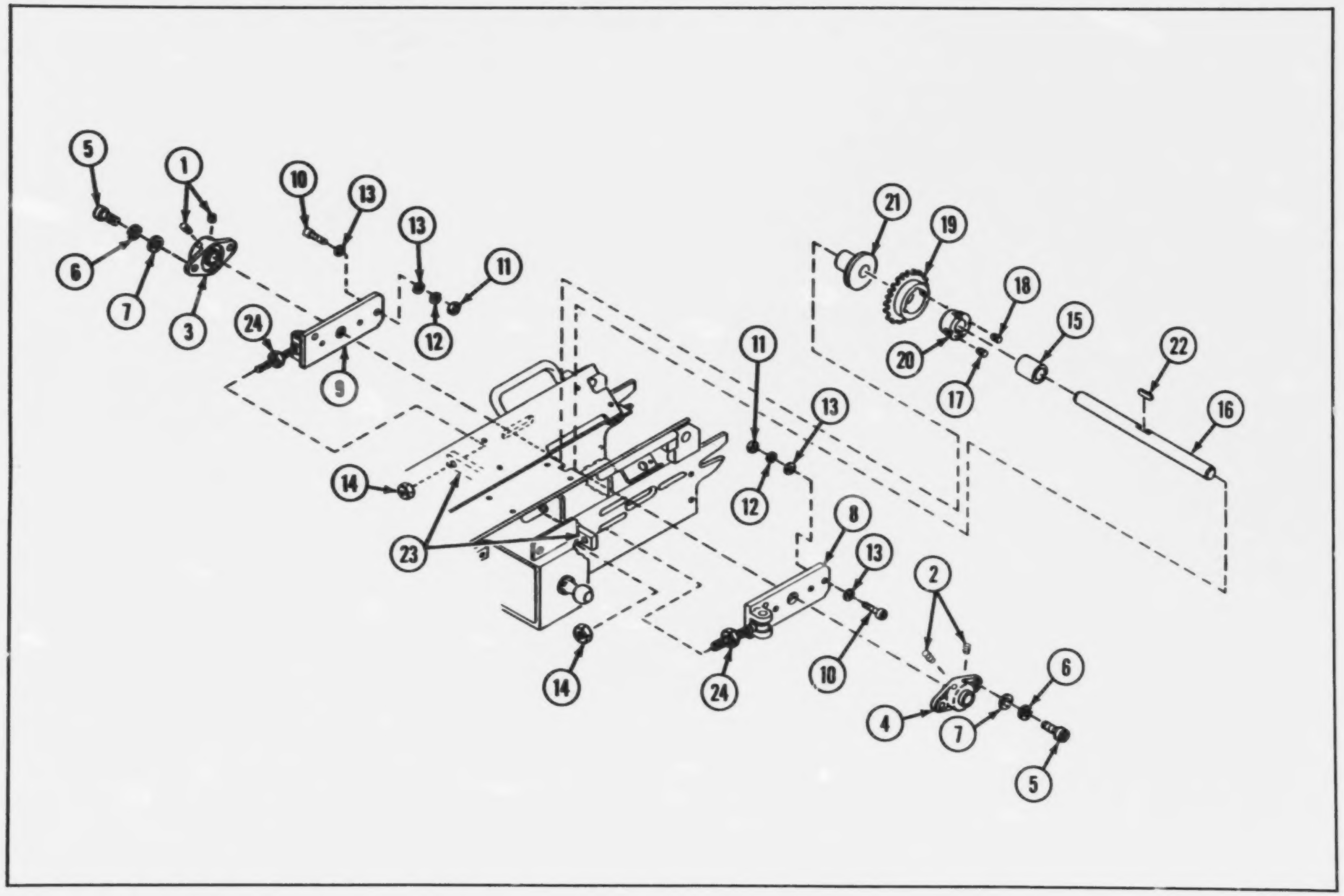
INSTALLATION

A Install roller bracket (3) on conveyor assembly (4) with eight new lockwashers (2) and eight screws (1).

B Fold down conveyor dead-end sections.

TA313033

IDLER SPROCKET ASSEMBLY: REMOVAL AND INSTALLATION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TA310210

IDLER SPROCKET ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

A Remove conveyor chain assembly (TM 9-2350-267-10).

B Loosen two setscrews (1 and 2) from each flanged bearing assembly (3 and 4).

C Remove two screws (5), two lockwashers (6) and two flat washers (7) from each flanged bearing (3 and 4).

D Remove two flanged bearings (3 and 4).

E Remove two takeup plates (8 and 9) by removing from each, three screws (10), three nuts (11), three lockwashers (12), six flat washers (13) and nut (14).

F Remove spacer (15) from shaft (16).

G Remove two lockscrews (17 and 18), and tap sprocket (19) loose from hub (20).

H Remove shaft (16), with sprocket (19), spacer (21) and hub (20) from conveyor assembly.

I Remove spacer (21) and sprocket (19) from shaft.

J Drive hub (20) from shaft (16), and remove key (22).

INSTALLATION

A Install hub (20) and key (22) on shaft (16).

B Position sprocket (19) on shaft (16) but do not secure to hub (20). Position spacer (21) on shaft (16).

C Install shaft (16) with spacer (21) and sprocket (19) positioned on shaft in conveyor assembly. Once in position, install sprocket (19) on hub (20) and secure with lockscrews (17 and 18). Do not tighten lockscrews.

D Install spacer (15) on shaft (16).

E Install nut (24) on adjusting rod of both takeup plates (8 and 9). Insert rod through bracket (23) and install nut (14).

F Insert ends of shaft (16) through takeup plates (8 and 9) and secure each plate to conveyor assembly by installing three screws (10), three lockwashers (12), six flat washers (13) and nut (14).

G Insert ends of shaft (16) through each flanged bearing assembly (3 and 4) and secure each bearing to takeup plate with two screws (5), two lockwashers (6) and two flat washers (7).

H Aline sprocket (19) with center of conveyor and tighten two lockscrews (17 and 18).

I Install and tighten four setscrews (1 and 2).

J Install conveyor chain assembly (TM 9-2350-267-10).

K Adjust conveyor chain tension (TM 9-2350-267-10).

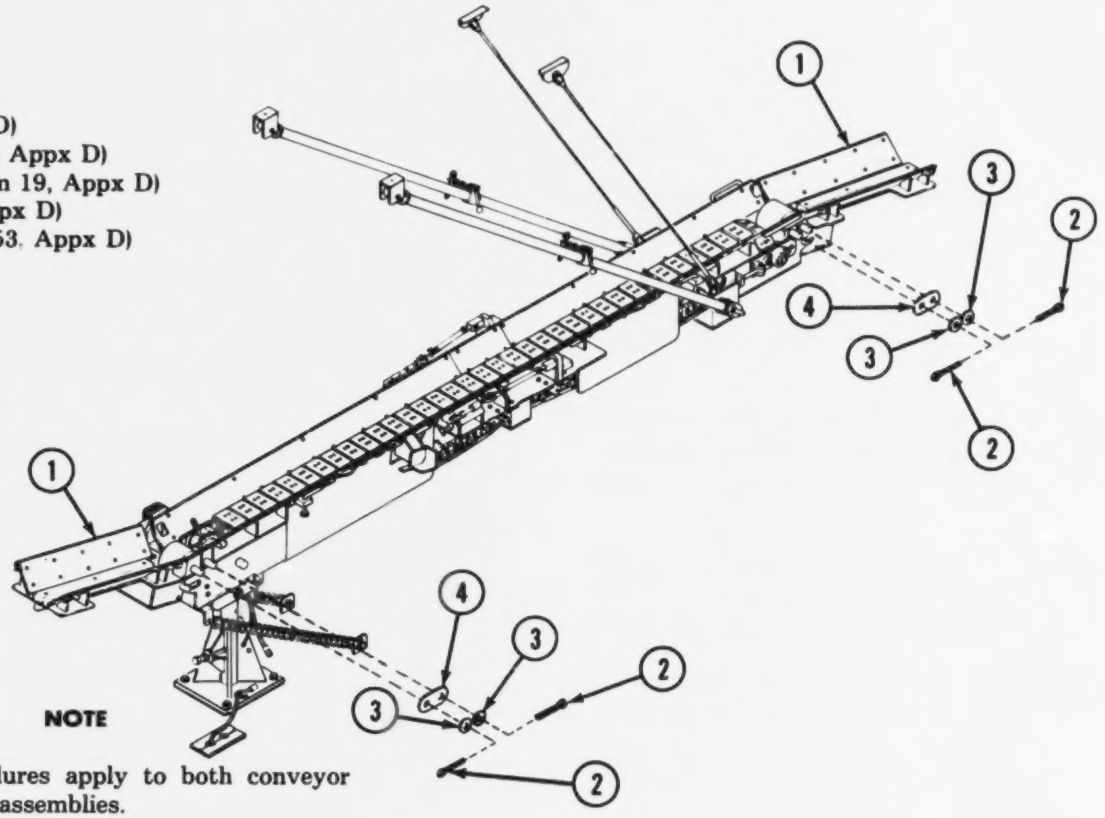
TA310211

DEAD-END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Adhesive (item 1, Appx D)
Adhesive, rubber (item 4, Appx D)
Dry-cleaning solvent (item 19, Appx D)
Rag, wiping (item 50, Appx D)
Sealing compound (item 53, Appx D)



NOTE

Following procedures apply to both conveyor dead-end section assemblies.

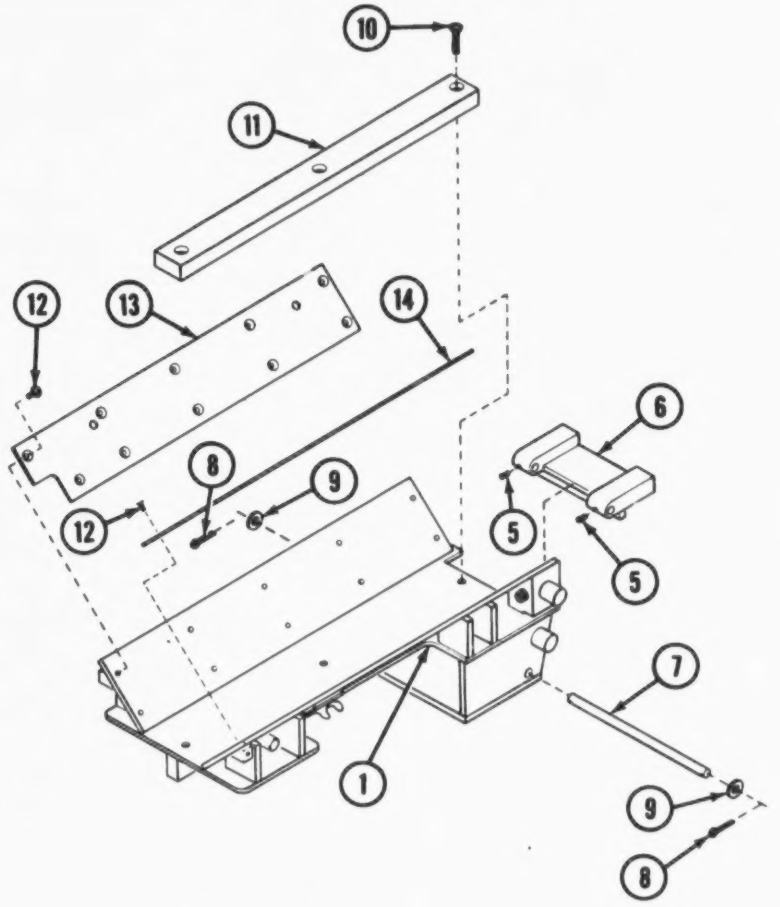
REMOVAL

A Fold up conveyor dead-end section (1) and from each side remove two cotter pins (2), two flat washers (3) and one connecting link (4). Discard cotter pins.

B Firmly grasp conveyor dead-end section assembly (1) and pull away from adjoining conveyor section.

TA57273

DEAD-END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove two setscrews (5) that secure flipper block (6) to support bar (7).

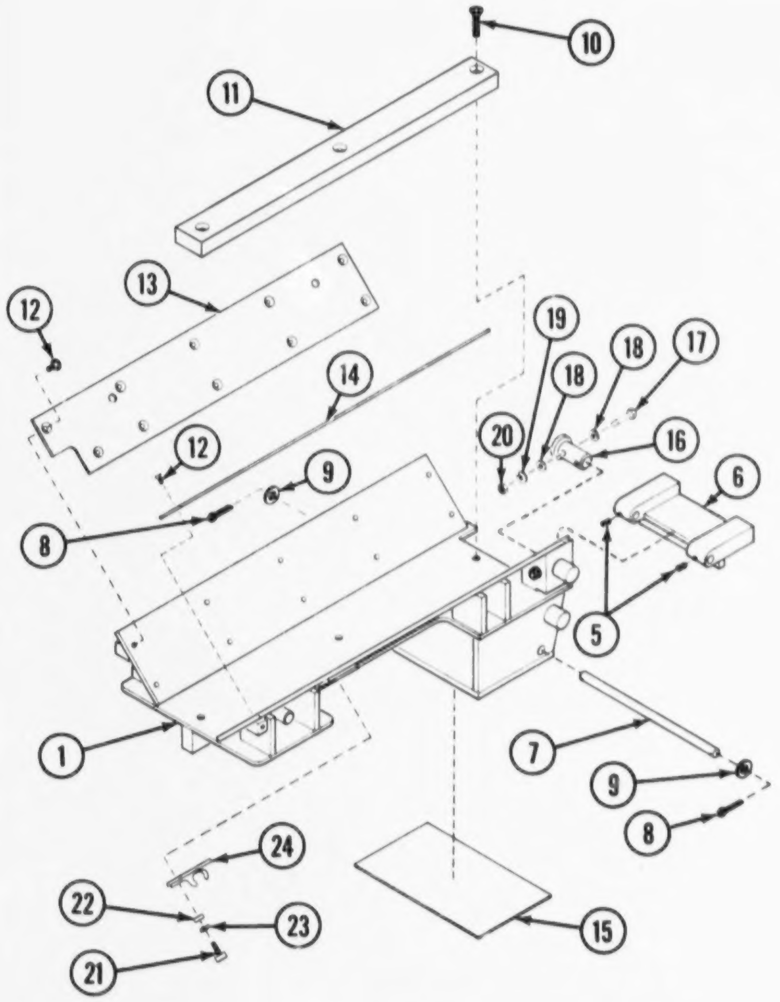
B Remove two cotter pins (8) and two flat washers (9) and drive out support bar (7). Remove flipper block (6) from dead-end section (1). Discard cotter pins.

C Remove three screws (10) from bottom wear strip (11). Pry strip (11) from surface of dead-end section (1). Discard screws and wear strip.

D Remove 20 screws (12) from wear strips (13 and 14). Pry wear strips (13 and 14) from surface of dead-end section (1). Discard screws and wear strips.

TA57272

DEAD-END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



E Pry rubber strip (15) from underside surface of dead-end section (1). Discard rubber strip.

F Remove two pins (16) by removing two screws (17), four flat washers (18), two lockwashers (19) and two nuts (20). Discard lockwashers.

G Remove two screws (21), two flat washers (22), two lockwashers (23) and latch (24). Discard lockwashers.

ASSEMBLY

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy, get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

TA57270

DEAD-END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

A Thoroughly clean wear strip mounting surfaces of section (1) with dry-cleaning solvent (item 19, Appx D) and clean, dry rags (item 50, Appx D). Remove all particles.

B Roughen underside surface of new wear strips (11, 13 and 14); apply adhesive (item 1, Appx D) to roughened side of wear strips and mounting surface of section (1). Allow adhesive to dry until tacky before assembly.

C Apply a thin coat of adhesive (item 4, Appx D) to new rubber strip (15), and to mounting surface of end section (1). Allow adhesive to dry until tacky before installing rubber strip. Install new rubber strip (15) to mounting surface of dead-end section (1).

D Install latch (24) on side of dead-end section (1) using two screws (21), two new lockwashers (23) and two flat washers (22).

E Install two pins (16) to dead-end section (1) and secure using two screws (17), four flat washers (18), two new lockwashers (19) and two nuts (20).

F Apply sealing compound (item 53, Appx D) to threads of 20 new screws (12). Install wear strips (13 and 14) to surface of dead-end section (1) using 20 new screws (12).

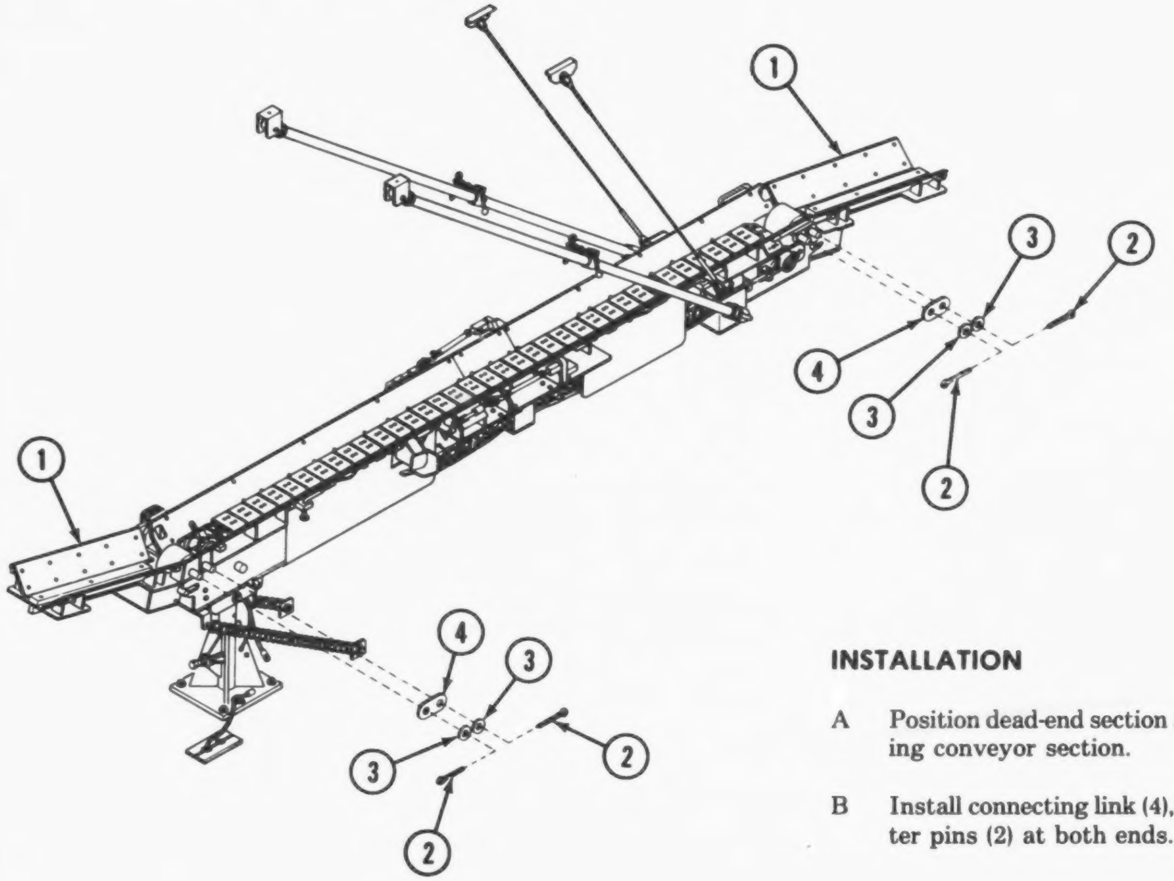
G Apply sealing compound (item 53, Appx D) to threads of screws (10). Assemble bottom wear strip (11) to surface of dead-end section (1) using three new screws (10).

H Position and aline flipper block (6) with holes in dead-end section (1). Drive support bar (7) into position and secure using two flat washers (9) and two new cotter pins (8).

I Install two setscrews (5) to secure flipper block (6) to support bar (7). Tighten setscrews (5).

TA57269

DEAD-END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



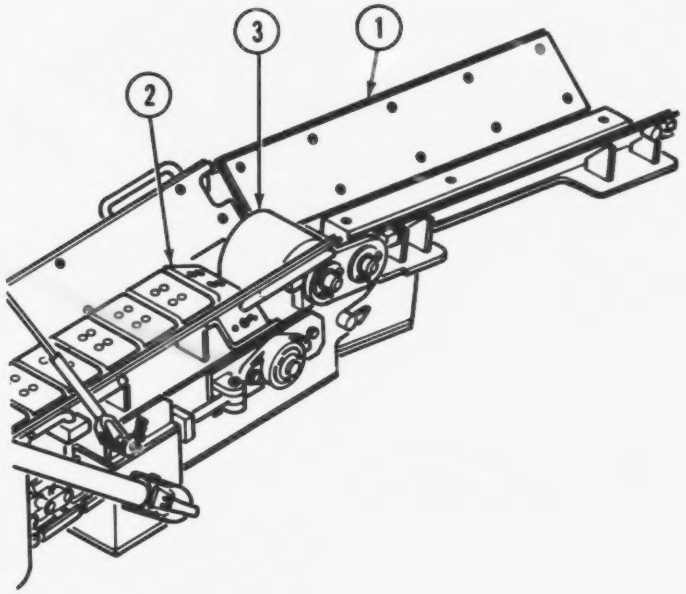
INSTALLATION

A Position dead-end section assembly (1) in alinement with adjoining conveyor section.

B Install connecting link (4), two flat washers (3) and two new cotter pins (2) at both ends.

TA57268

TAKE-UP END SECTION ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Remove conveyor assembly from vehicle (p 12-27).

B Remove conveyor dead-end section assembly (1) (p 12-12).

C Remove electrical wiring harness from conveyor (p 6-121).

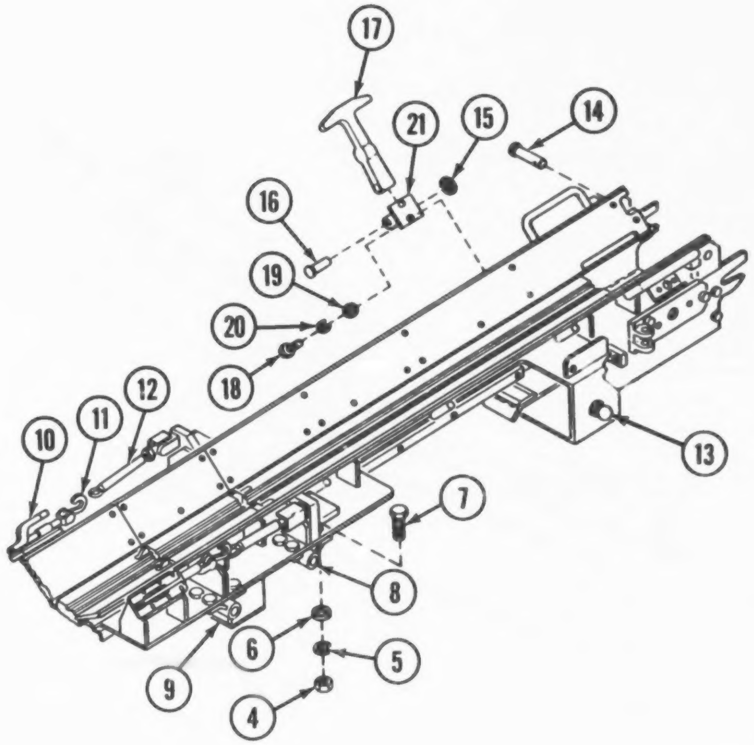
D Remove conveyor chain assembly (2) (p 12-19). Do not remove chain assembly from conveyor.

E Remove roller assembly (3) (p 12-9).

F Remove idler sprocket assembly (p 12-10).

TA310215

TAKE-UP END SECTION ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



G Remove three nuts (4), three lockwashers (5), three flat washers (6) and three screws (7), that secure hinge halves (8) to take-up end section. Allow hinges to remain attached to conveyor center section (9).

H Raise toggle clamps (10) to release safety hooks (11) from tube assemblies (12).

I Remove tube assemblies (12) (p 12-20), and ball assemblies (13) (p 12-17).

J Remove wear strips (p 12-18).

K Remove two pins (14) from take-up end section.

L Remove clip (15) and pin (16). Remove rubber latch (17). Remove two screws (18), two flat washers (19), two lockwashers (20), and bracket (21).

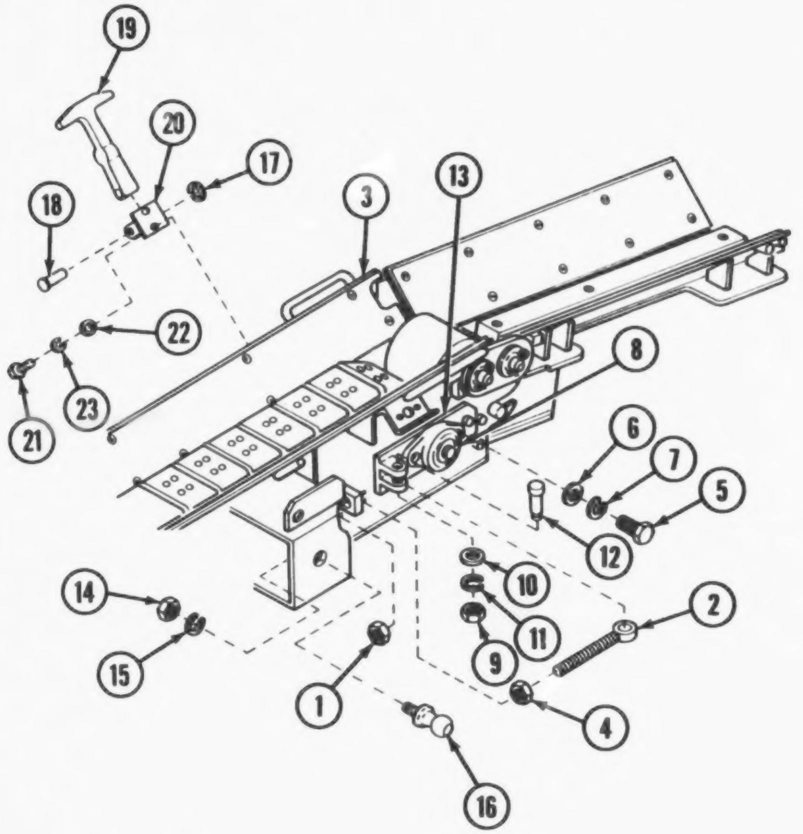
M Remove take-up end section from center section.

INSTALLATION

Reverse order of removal procedures.

TA310216

ROD ENDS, BALL ASSEMBLIES AND LATCH: REMOVAL AND INSTALLATION



REMOVAL

A Remove two nuts (1) from each rod end (2) located on each side of conveyor take-up section (3), and back off nut (4).

B Remove one screw (5), one flat washer (6), and one lockwasher (7), from each of two pillow blocks (8).

C Remove nut (9), flat washer (10), lockwasher (11), screw (12) and remove rod end (2) from take-up plates (13).

D Back off nut (4) from rod end (2). Remove rod end (2) from take-up plates (13) and remove nut (4) from rod end (2).

E Remove nut (14), lockwasher (15) and remove ball assembly (16) from each side of conveyor take-up section (3).

F Remove clip (17), pin (18), and rubber latch (19) from bracket (20).

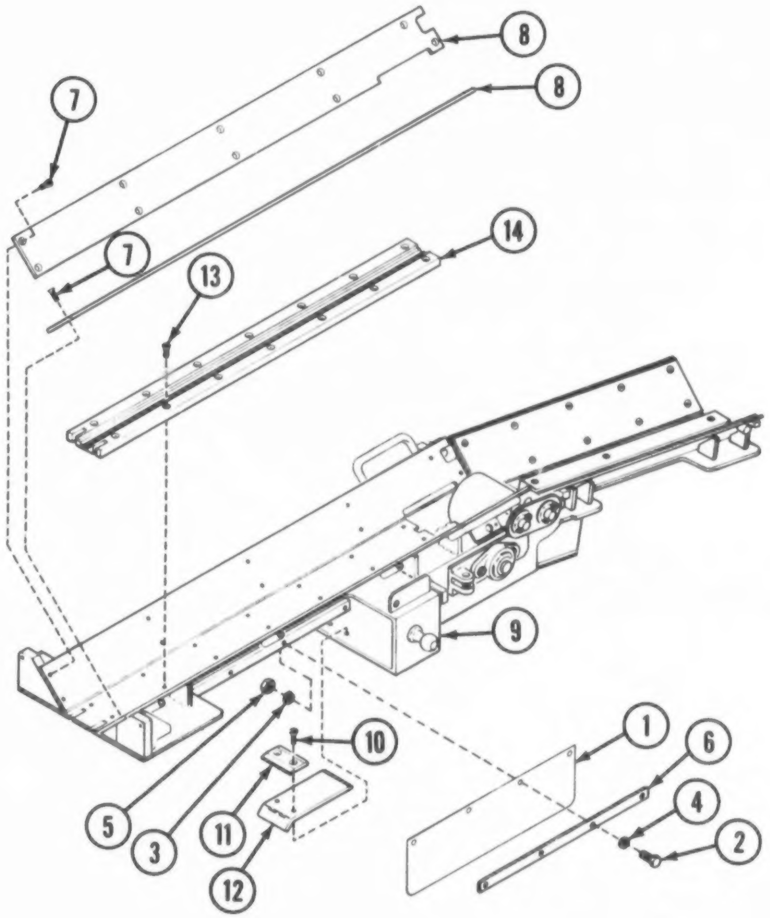
G Remove two screws (21), two flat washers (22), two lockwashers (23) and bracket (20) from take-up section (3).

INSTALLATION

Reverse order of removal procedures.

TA310217

SIDE WEAR STRIPS, BOTTOM WEAR STRIP, CHAIN RETURN WEAR STRIPS AND CHAIN GUARD, TAKE-UP END ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Remove chain assembly (TM 9-2350-267-10).

B Remove two chain guards (1) by removing from each, four screws (2), four lockwashers (3), four flat washers (4), four nuts (5) and retaining strip (6).

C Remove 10 screws (7) from each side wear strip (8). Pry up and remove side wear strips from take-up end section (9).

D Remove two screws (10), wear strip (11) and spacer (12) from take-up end section (9).

E Remove 14 screws (13) and remove bottom wear strip (14) by prying up wear strip from take-up end section.

INSTALLATION

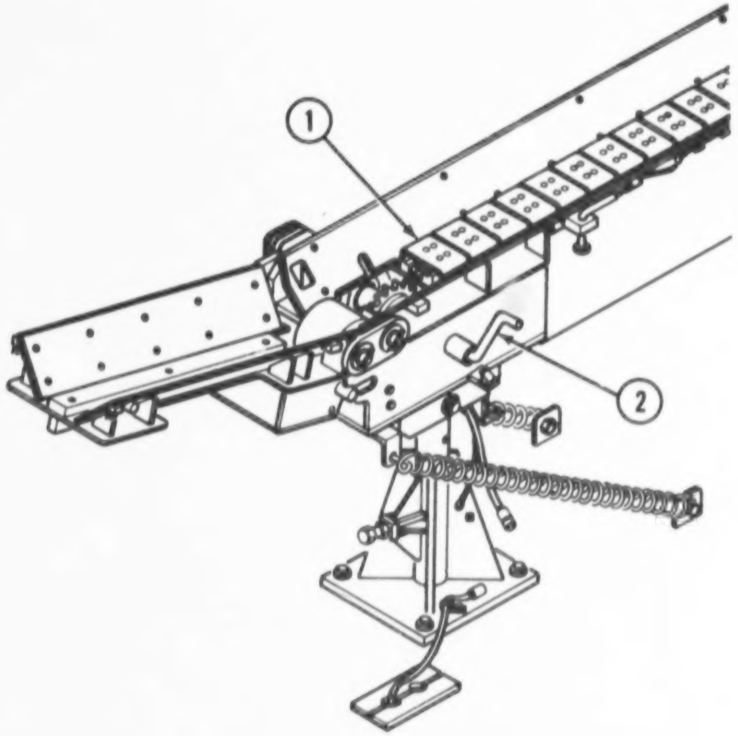
A Thoroughly clean wear strip mounting surfaces of section (9) with solvent (item 19, Appx D). Remove all particles.

B Roughen underside of wear strips (8). Apply adhesive (item 1, Appx D) to roughened side of wear strip and mounting surface of section (9). Allow to dry until tacky before installation. Apply sealing compound (item 53, Appx D) to threads of screws (7).

C Reverse order of removal procedures.

TA310218

CONVEYOR CHAIN ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Loosen chain tension and break chain at master link (TM 9-2350-267-10).

B Remove chain (1) from conveyor by rotating conveyor manual hand crank (2) until chain is free of drive sprockets.

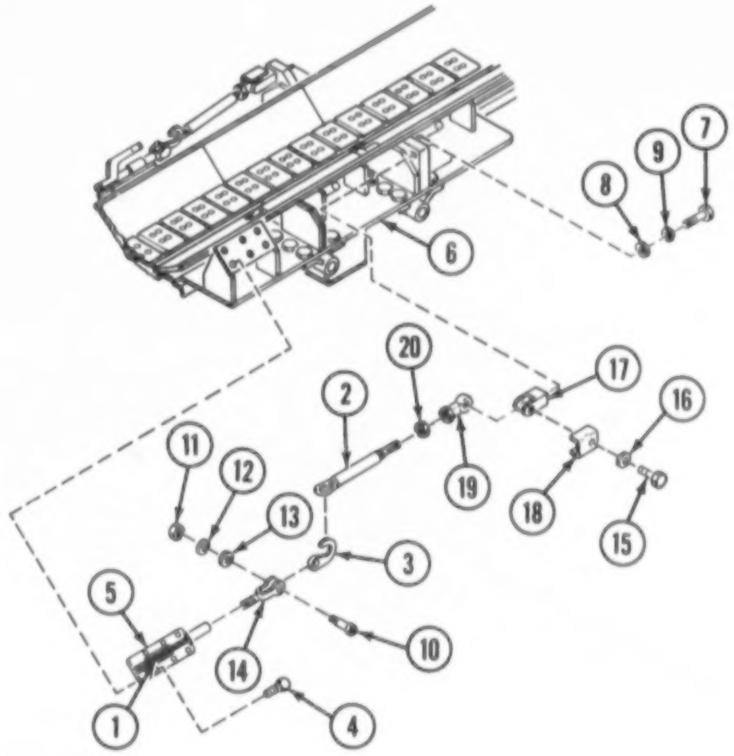
INSTALLATION

A Adjust conveyor chain tension (TM 9-2350-267-10).

B Reverse removal procedures.

TA310219

CONVEYOR TOGGLE CLAMP AND TUBE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

NOTE

The following procedures apply to both toggle clamps and tube assemblies.

WARNING

Do not attempt to remove or release both toggle clamps at the same time. Conveyor could collapse and cause injury to personnel.

A Raise toggle clamp handle (1) to release tension on tube assembly (2). Remove tube eye from hook (3).

B Remove six screws (4) and toggle clamp (5) from conveyor center section (6).

C Remove screw (7), flat washer (8), lockwasher (9) and tube assembly (2).

DISASSEMBLY

A Remove screw (10), nut (11), lockwasher (12), flat washer (13) and hook (3).

B Turn out and remove clevis (14) from toggle assembly (5).

C Remove screw (15), flat washer (16) and remove clevis (17) and brace (18) from rod end (19).

D Back off jam nut (20) and remove rod end (19). Remove jam nut (20) from tube assembly (2).

ASSEMBLY

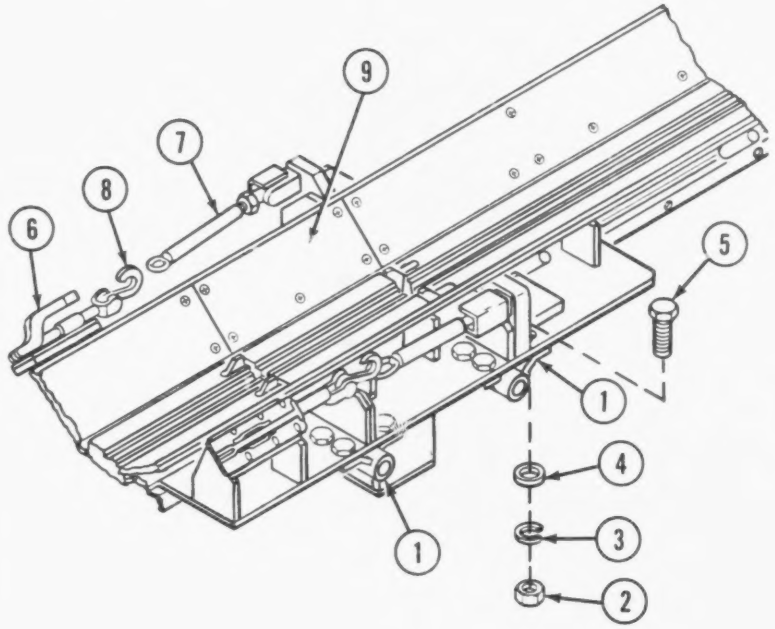
Reverse order of disassembly procedures.

INSTALLATION

Reverse order of removal procedures.

TA310220

CONVEYOR CENTER SECTION ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Remove conveyor from vehicle (p 12-27).

B Remove conveyor chain assembly (TM 9-2350-267-10).

C Remove conveyor electrical wiring harness (p 6-121).

D Remove from each hinge half (1), three nuts (2), three lockwashers (3), three flat washers (4) and three screws (5).

WARNING

Be sure to support center section when hardware is removed and toggle clamps are raised to prevent injury to personnel.

E Raise both toggle clamps (6) to release tension on tube assemblies (7), and remove tube eye from hooks (8).

F Remove center section (9).

INSTALLATION

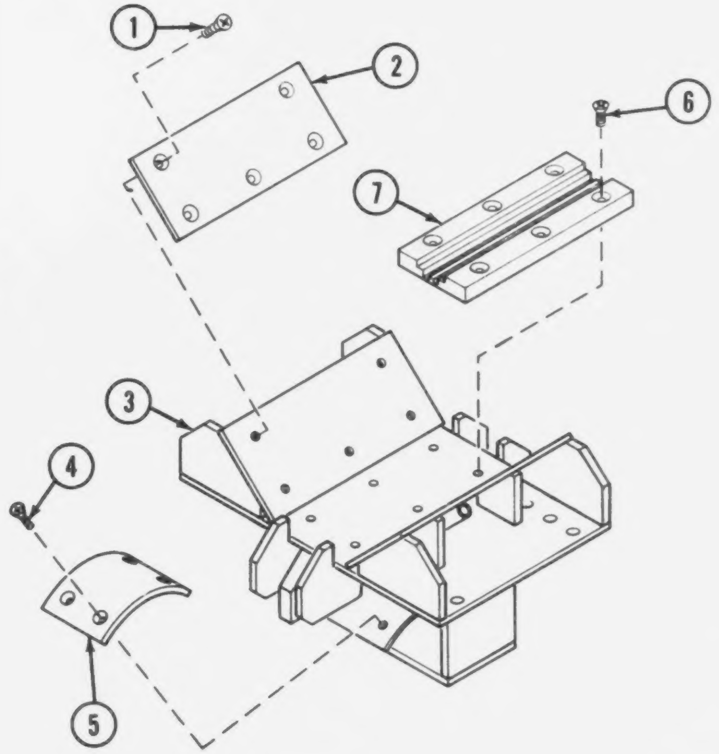
A Reverse order of removal procedures.

B Reinstall chain assembly (TM 9-2350-267-10).

C Reinstall conveyor wiring harness (p 6-121).

TA310221

CENTER SECTION ASSEMBLY SIDE WEAR STRIPS, CHAIN RETURN WEAR STRIP AND BOTTOM WEAR STRIP: REMOVAL AND INSTALLATION



REMOVAL

A Remove chain assembly (TM 9-2350-267-10).

B Remove five screws (1) from each side wear strip (2). Pry up and remove wear strips from center section (3).

C Remove four screws (4) and chain return wear strip (5).

D Remove six screws (6) and bottom wear strip (7).

INSTALLATION

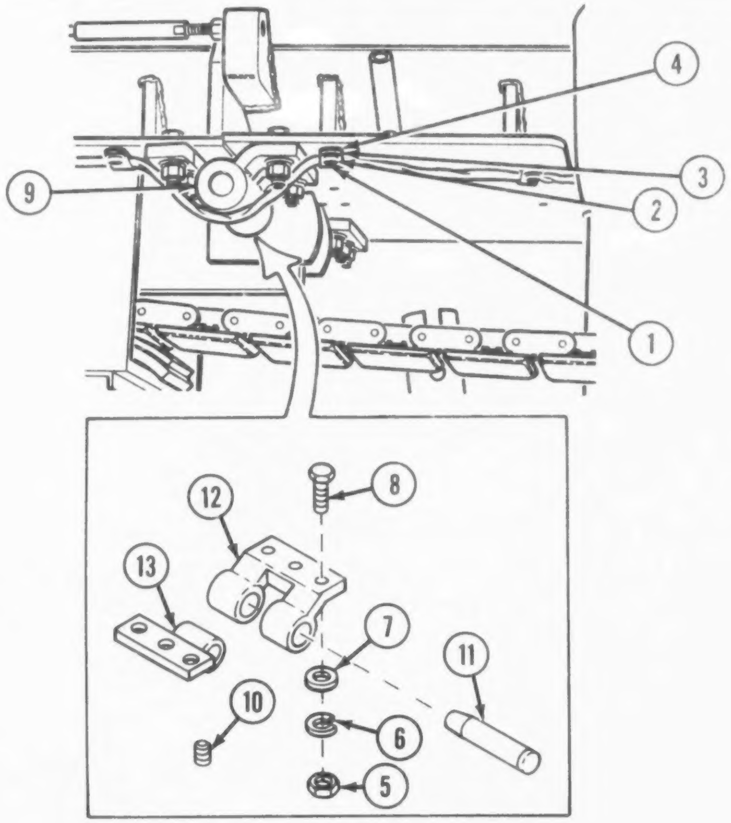
A Reverse order of removal procedures.

B Thoroughly clean wear strip mounting surface of section (3) with solvent (item 19, appx D) and clean, dry rags (item 50, appx D). Remove all particles.

C Roughen underside surface of wear strips (2). Apply adhesive (item 4, appx D) to roughened side of wear strips (2) and mounting surface of section (3). Allow to tack dry approximately 5 minutes before installation. Apply sealing compound (item 53, appx D) to threads of screws (1).

TA310222

CONVEYOR HINGE ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



NOTE

The following procedures apply to all four hinge assemblies.

WARNING

Do not remove more than one hinge at a time. Conveyor could collapse and injure personnel. Do not operate or stow conveyor with hinge removed.

NOTE

Do step A for left side hinge removal only. Otherwise start at step B.

REMOVAL

A Remove cable clamps (1) on both sides of hinge by removing from each, one screw (2), one lockwasher (3) and one flat washer (4).

B Remove six nuts (5), six lockwashers (6), six flat washers (7) and six bolts (8).

C Remove hinge assembly (9) from conveyor sections.

DISASSEMBLY

A Loosen setscrew (10) and drive out hinge pin (11).

B Separate hinge halves (12 and 13).

ASSEMBLY

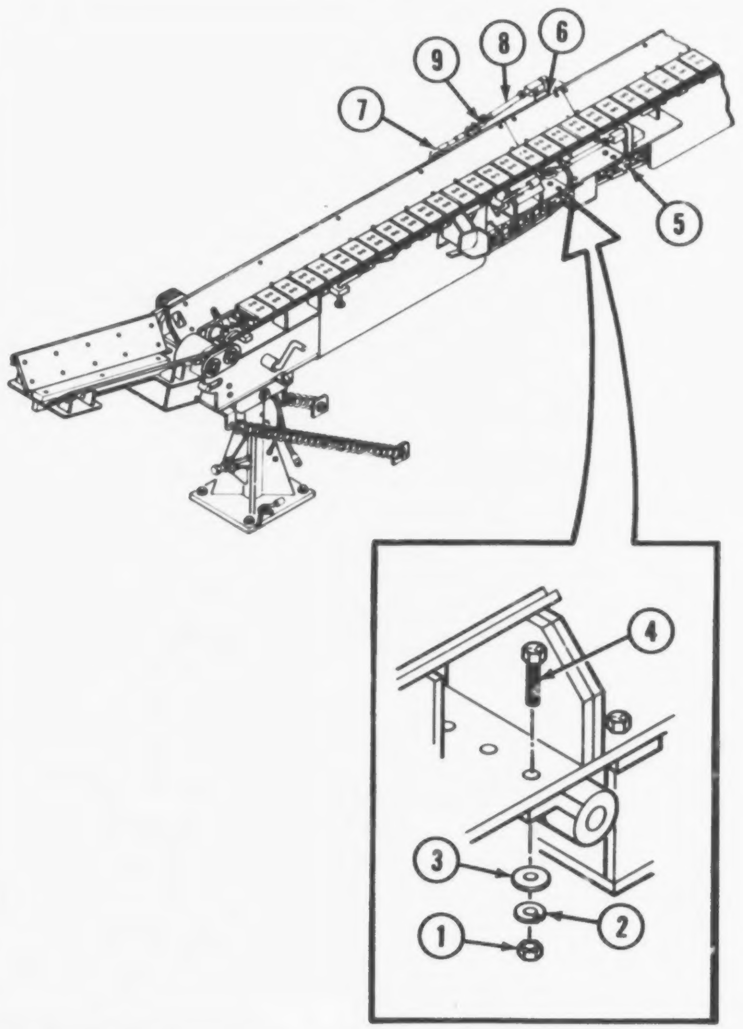
Reverse disassembly procedures.

INSTALLATION

Reverse removal procedures.

TA310223

DRIVE END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove conveyor assembly from vehicle (p 12-27).

B Remove conveyor chain assembly (TM 9-2350-267-10).

C Remove electrical wiring harness (p 6-121).

D Remove dead-end section from drive-end section (p 12-12).

E Remove three nuts (1), three lockwashers (2), three flat washers (3) and three screws (4) from two hinge halves (5).

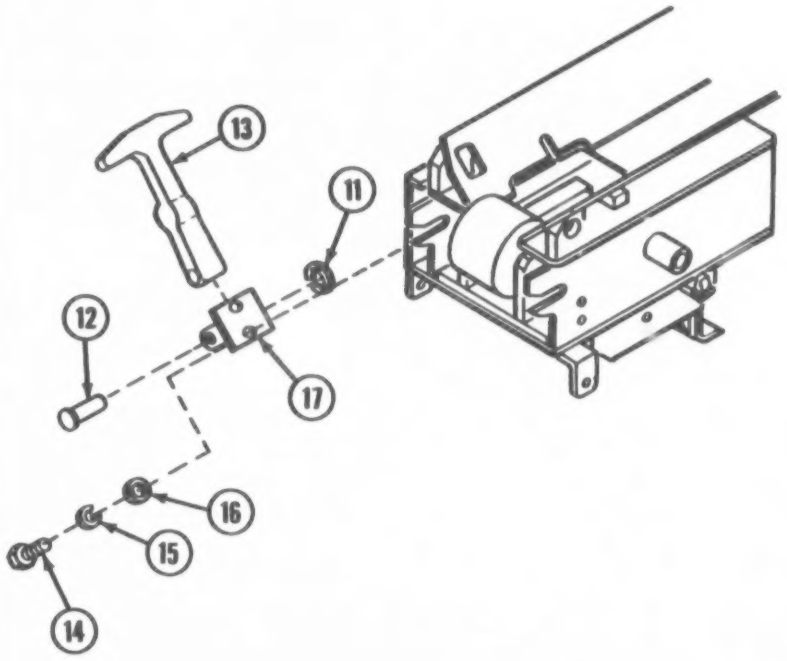
NOTE

Allow hinge halves to remain secured to center section (6).

F Release toggle clamps (7) and disconnect tube assembly (8) from safety hooks (9) and remove drive-end section from conveyor assembly.

TA310224

DRIVE-END SECTION ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove hydraulic motor (p 12-29).

B Remove drive-end section coupling sprocket, pillow blocks and drive sprocket assembly (p 12-7).

C Remove toggle clamps (p 12-20).

D Remove wear strips (p 12-26).

E Remove clip (11), pin (12) and rubber latch (13).

F Remove two screws (14), two lockwashers (15), two flat washers (16) and bracket (17).

ASSEMBLY

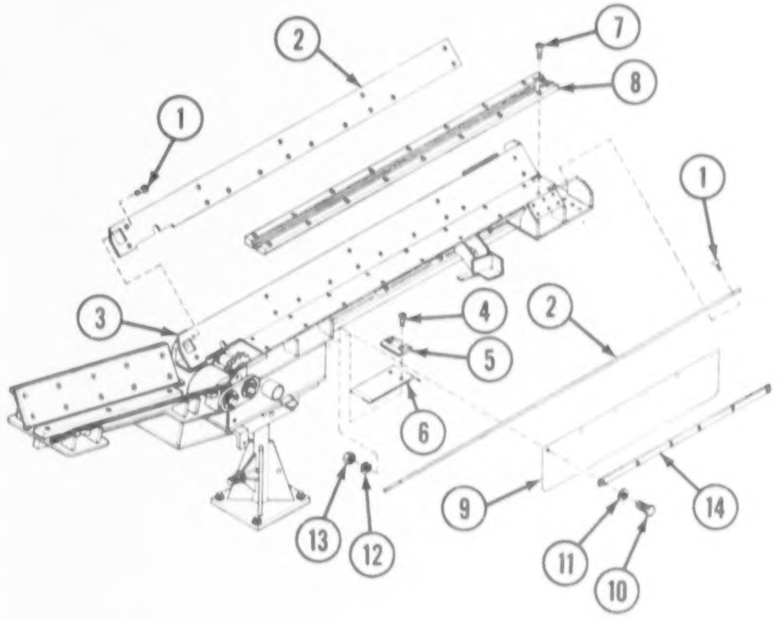
Reverse order of disassembly procedures.

INSTALLATION

Reverse order of removal procedures.

TA310225

DRIVE-END SECTION SIDE WEAR STRIPS, CHAIN RETURN WEAR STRIP, BOTTOM WEAR STRIP, CHAIN GUARDS: REMOVAL AND INSTALLATION



REMOVAL

NOTE

Do not remove chain from around take-up end section.

A Remove chain assembly from work area (TM 9-2350-267-10).

B Remove 10 screws (1) from each side wear strip (2). Pry up and remove wear strips from drive-end section (3).

C Remove two screws (4), wear strip (5) and spacer (6) from conveyor section.

D Remove 16 screws (7) and bottom wear strip (8).

E Remove chain guard (9) by removing from each, six screws (10), six flat washers (11), six lockwashers (12), six nuts (13) and retaining strip (14).

INSTALLATION

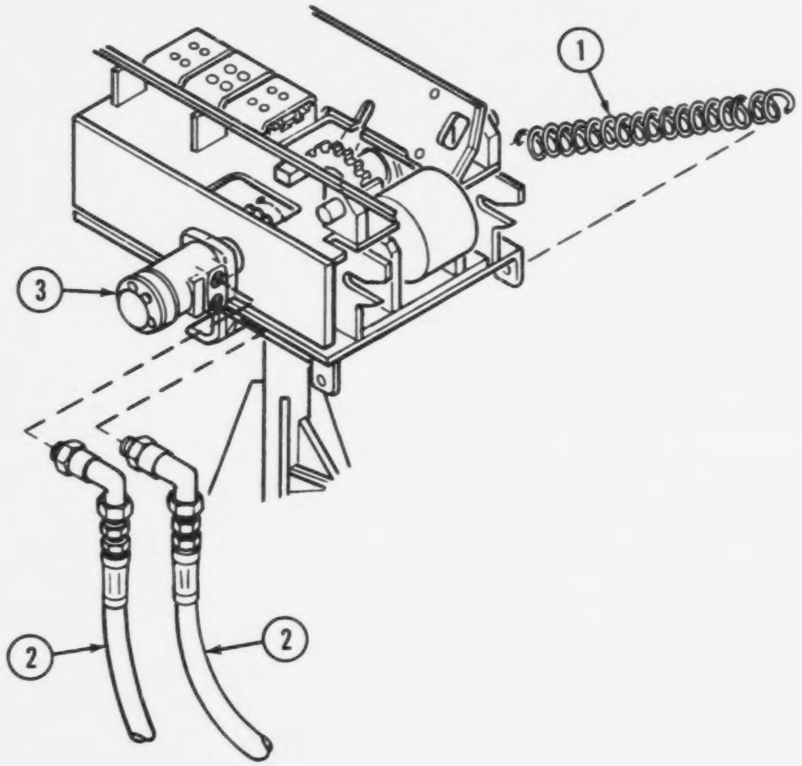
A Reverse order of removal procedures.

B Thoroughly clean wear strip mounting surface of section (3) with solvent (item 19, Appx D) and clean, dry rags (item 50, Appx D). Remove all particles.

C Roughen underside surface of wear strips (2). Apply adhesive (item 1, Appx D) to roughened side of wear strips (2) and mounting surface of section (3). Allow to dry until tacky before installation. Apply sealing compound (item 53, Appx D) to threads of screws (1).

TA310226

CONVEYOR ASSEMBLY AND SUPPORT STAND: REMOVAL AND INSTALLATION



REMOVAL

NOTE

This procedure will require four personnel.

A Remove springs (1) (p 12-6).

WARNING

Be careful when deploying conveyor without springs attached. Deploy slowly.

B Deploy conveyor slowly but do not attach support arms (TM 9-2350-267-10).

C Place support under conveyor.

D Disconnect electrical wiring harness connectors at drive-end section and remove harness and clamp from support stand (p 6-121).

E Disconnect hydraulic lines (2) from conveyor motor (3).

TA310227

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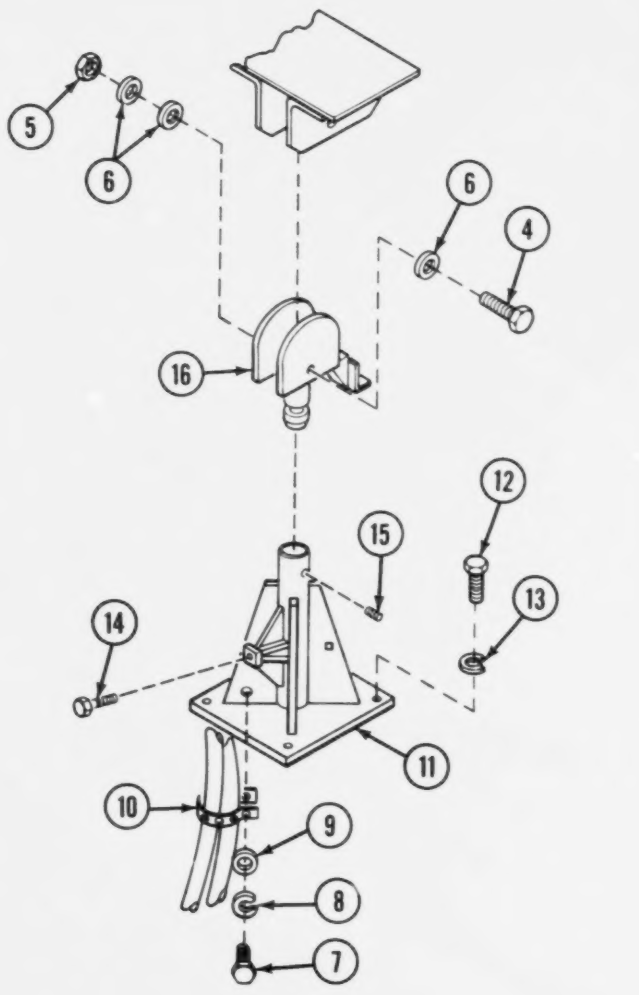
CONVEYOR ASSEMBLY AND SUPPORT STAND: REMOVAL AND INSTALLATION (CONTINUED)



F Remove bolt (4), nut (5) and three washers (6).

G Disconnect conveyor support cables by removing quick-disconnect pins (p 12-2).

H Lift and remove conveyor assembly from vertical support and move from work area.

I Remove screw (7), lockwasher (8), flat washer (9) and strap (10) that secure two hydraulic hoses to support stand (11).

J Remove four bolts (12) and four lockwashers (13) and remove support stand (11).

K Unscrew and remove support stand stop (14).

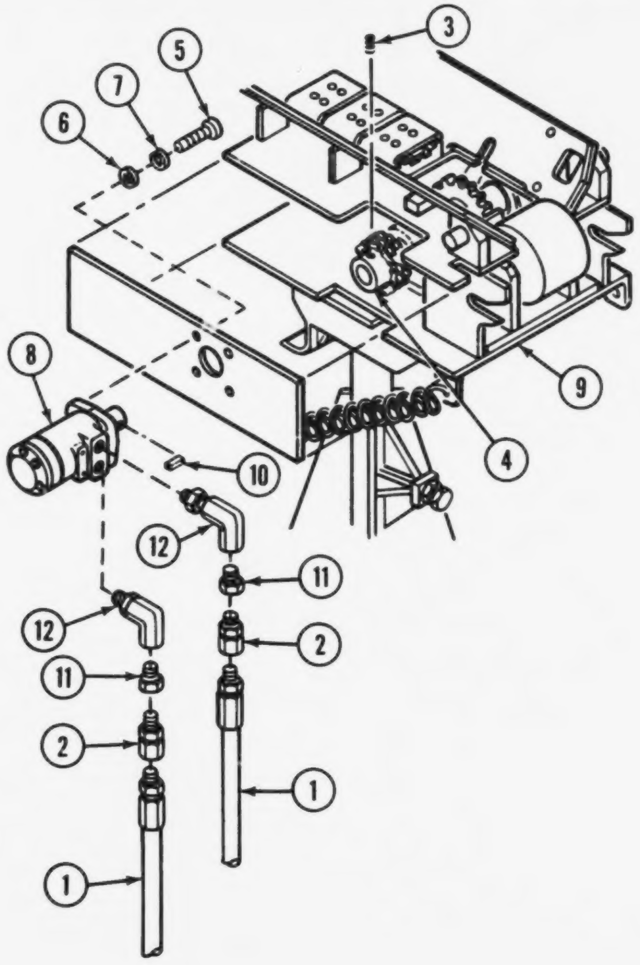
L Loosen two setscrews (15) securing top support (16) to support stand (11) and remove top support (16).

INSTALLATION

Reverse order of removal procedures.

TA310228

HYDRAULIC MOTOR: REMOVAL AND INSTALLATION



NOTE

Tag hydraulic lines for reinstallation.

REMOVAL

A Disconnect two motor hydraulic lines (1) from two adapters (2).

B Loosen setscrew (3) in coupling sprocket (4).

C Remove four screws (5), four flat washers (6), and four lockwashers (7) that secure motor (8) to conveyor drive-end section (9). Pull motor (8) from conveyor drive-end section (9) and coupling sprocket (4).

D Remove key (10) from shaft of motor (8).

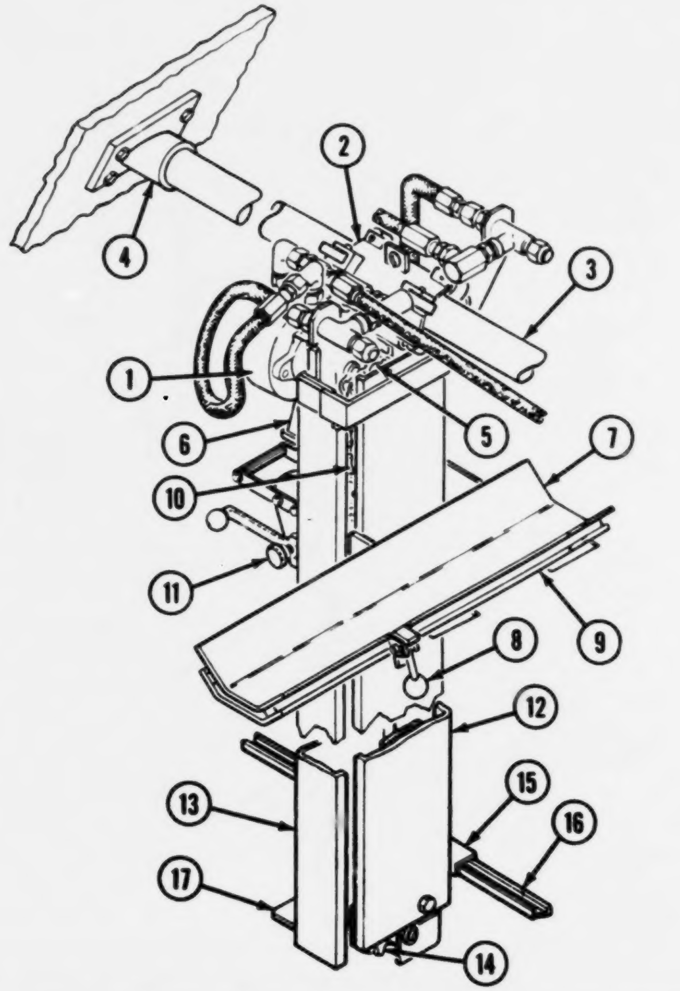
E Remove two adapters (2), two reducers (11) and two elbows (12) from motor (8).

INSTALLATION

Reverse order of removal procedures.

TA310229

Section II STACKER ASSEMBLY



LEGEND

1	Hydraulic motor and brake
2	Support assembly
3	Upper cross member
4	Support bracket
5	Drive sprocket
6	Motor support bracket
7	Sliding tray
8	Knob assembly
9	Carrier
10	Roller chain
11	Winch assembly
12	Outer guard
13	Inner guard
14	Idler sprocket
15	Sprocket support and foot brake
16	Wear strip
17	Foot brake pedal

TA313034

STACKER ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Stacker/crane lifting device (item 1, Appx G)
Suitable lifting device

Materials/Parts:

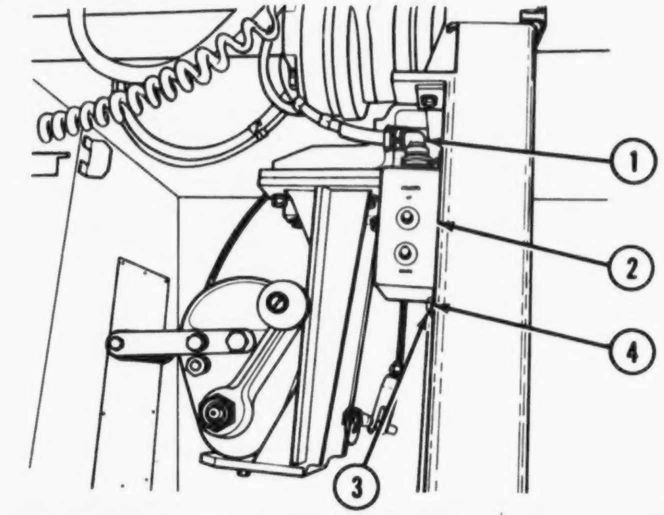
Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two

References:

TM 9-2350-267-10



REMOVAL

WARNING

High pressure hydraulic fluid is used to operate stacker. Serious injury may result when high pressure fluid comes in contact with skin. Shut off all hydraulic components before performing any maintenance.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

NOTE

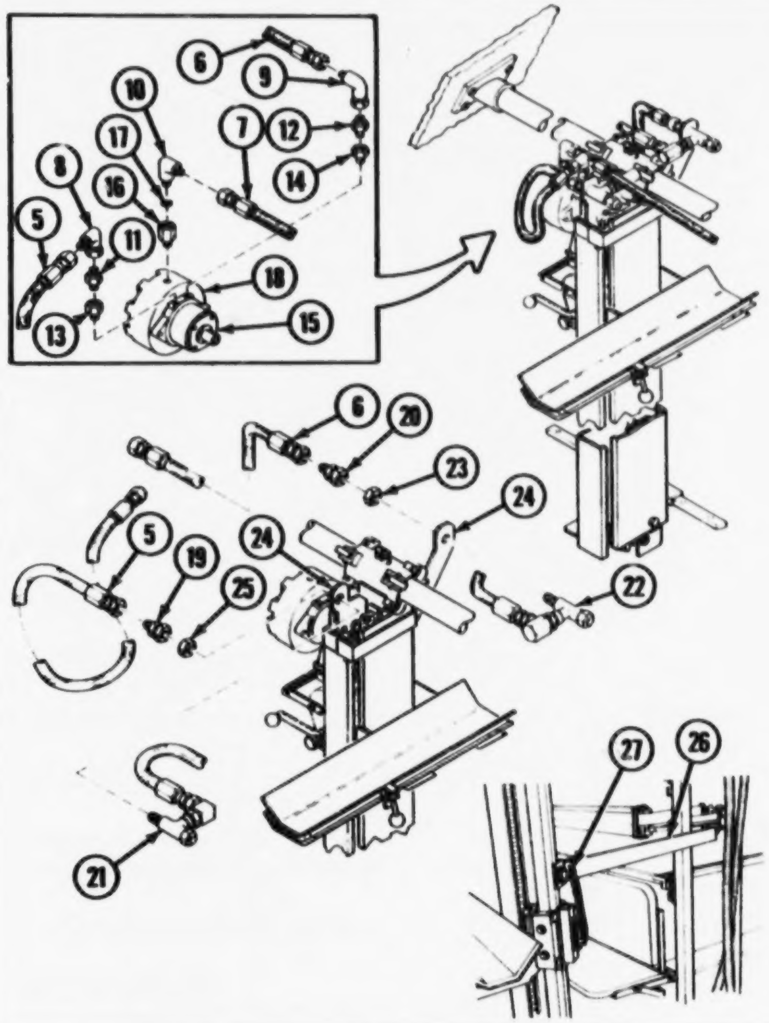
Note location and routing of hoses prior to removal. Tag hoses and fittings upon removal to ensure proper installation.

A Disconnect electrical connector (1) from stacker control switch box (2).

B Remove stacker control switch box (2) by removing four screws (3) and four lockwashers (4). Discard lockwashers.

TA57489

STACKER ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



C Disconnect three hydraulic hoses (5, 6 and 7) from elbows (8, 9 and 10).

D Remove elbows (8 and 9) from adapters (11 and 12).

E Remove adapters (11 and 12) from adapters (13 and 14).

F Remove adapters (13 and 14) from ports of hydraulic motor (15).

G Remove elbow (10) from expander (16).

H Remove preformed packing (17) from elbow (10) and discard.

I Remove expander (16) from port of hydraulic brake (18).

J Remove hose (5) from reducer assembly (19) and remove hose (6) from reducer assembly (20).

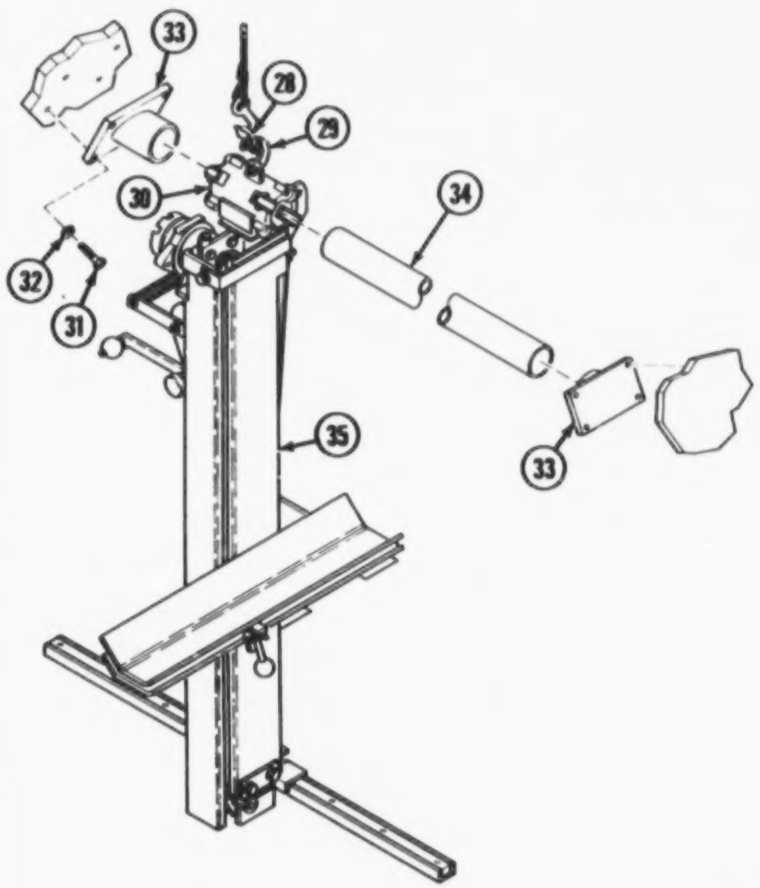
K Remove reducer assembly (19) from tee assembly (21) and remove reducer assembly (20) from tee assembly (22).

L Remove nut (23) and tee assembly (22) from stacker motor support bracket (24).

M Remove nut (25) and tee assembly (21) from stacker motor support bracket (24).

N Disconnect bar assembly (26) from stacker motor support bracket (24) by pulling quick-disconnect pin (27).

TA313036



O Open and secure vehicle top doors (TM 9-2350-267-10).

P Secure clevis (28) to stacker/crane lifting device (29).

CAUTION

Make sure stacker is supported. Do not allow stacker to fall.

NOTE

After attaching suitable lifting device to clevis, pay in cable to take slack out. Lifting device must support stacker and upper crossmember assembly.

Q Attach stacker/crane lifting device (29) to lifting eye on top of roller support (30). Attach suitable lifting device to clevis (28).

R Remove eight screws (31) and eight lockwashers (32) that secure two upper crossmember supports (33) to vehicle ceiling. Discard lockwashers.

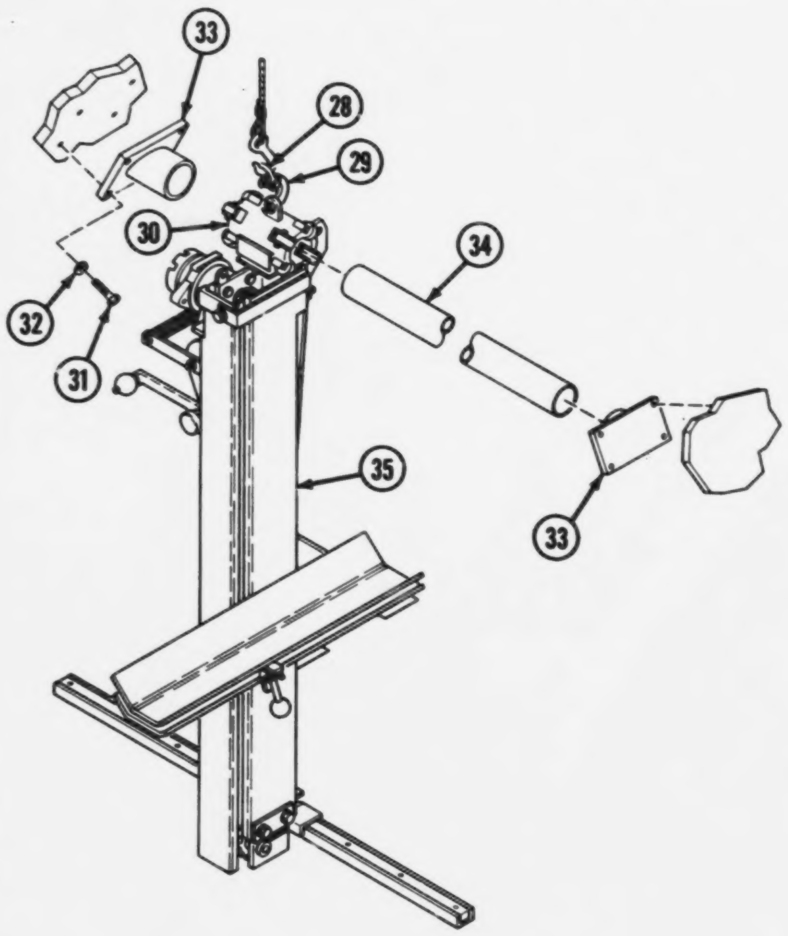
S Remove upper crossmember supports (33) from upper crossmember (34).

T Slide upper crossmember (34) out of stacker roller support (30).

U Lift stacker assembly (35) from vehicle and remove stacker/crane lifting device (29) from lifting eye on top of roller support (30).

TA313037

STACKER ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install stacker/crane lifting device (29) in lifting eye on top of roller support (30) and lift stacker assembly (35) into vehicle.

B Slide upper crossmember (34) through stacker roller support (30).

C Install upper support bracket (33) on upper crossmember (34).

D Apply zinc chromate paste (item 46, Appx D) to ceiling mating surface of upper support bracket (33).

E Secure two upper support brackets (33) to vehicle ceiling with eight screws (31) and eight new lockwashers (32).

F Remove lifting device from clevis (28) and remove stacker/crane lifting device (29) from lifting eye on top of roller support (30).

G Remove clevis (28) from stacker/crane lifting device (29).

H Close and secure vehicle top doors (TM 9-2350-267-10).

I Connect bar assembly (26) to stacker motor support bracket (24) with quick-disconnect pin (27).

J Install tee assembly (21) on stacker motor support bracket (24) and secure with nut (25).

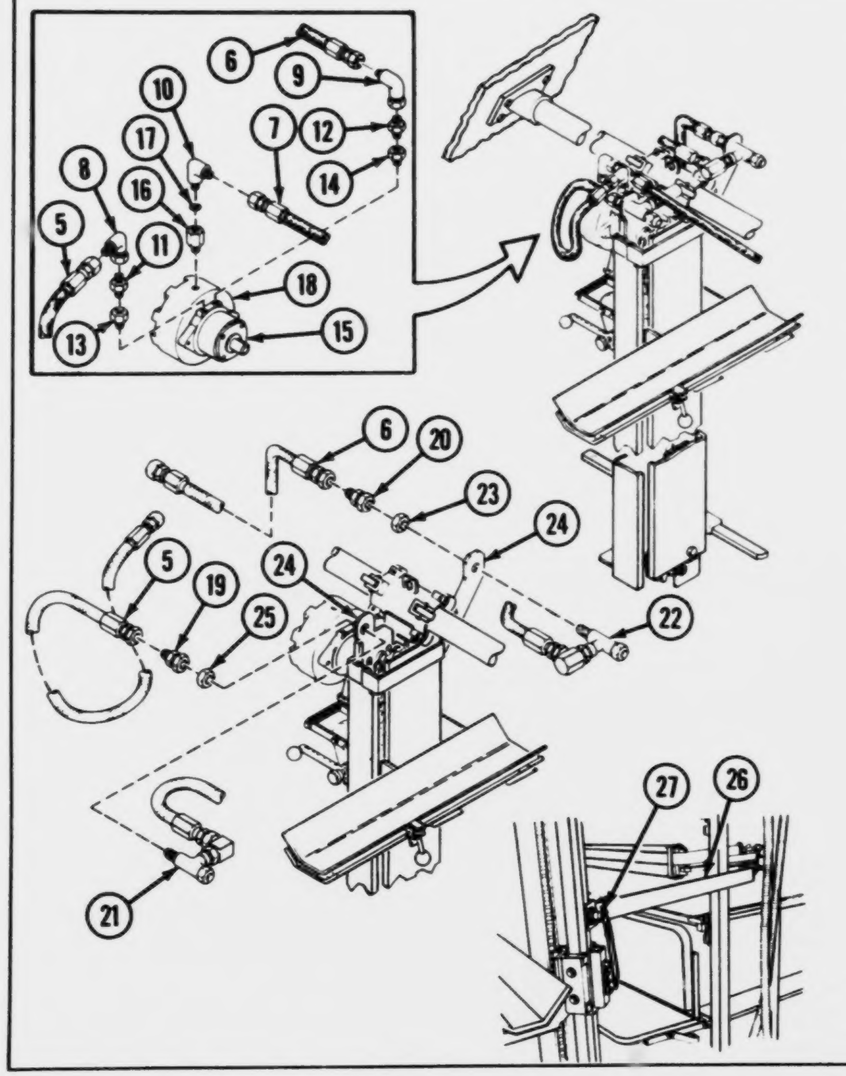
K Install tee assembly (22) on stacker motor support bracket (24) and secure with nut (23).

L Install reducer assemblies (19 and 20) on tee assemblies (21 and 22).

M Install hoses (5 and 6) on reducer assemblies (19 and 20).

TA57490

STACKER ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



N Install expander (16) in port of hydraulic brake (18).

O Install new preformed packing (17) on elbow (10).

P Install elbow (10) on expander (16).

Q Install adapters (13 and 14) in ports of hydraulic motor (15).

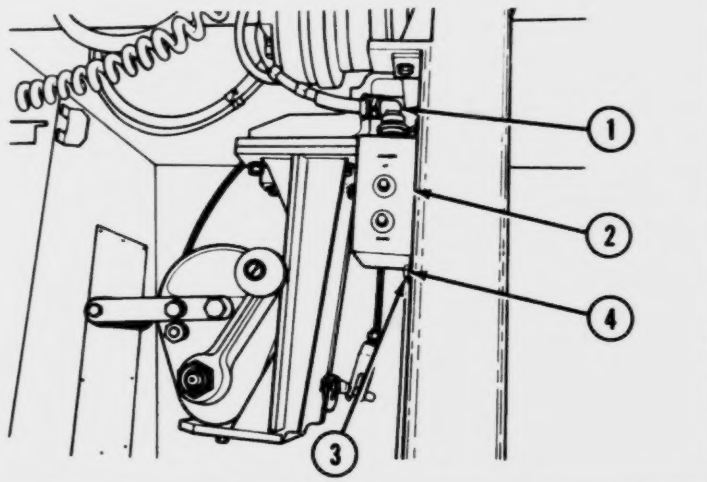
R Install adapters (11 and 12) on adapters (13 and 14).

S Install elbows (8 and 9) on adapters (11 and 12).

T Connect three hydraulic hoses (5, 6 and 7) to elbows (8, 9 and 10).

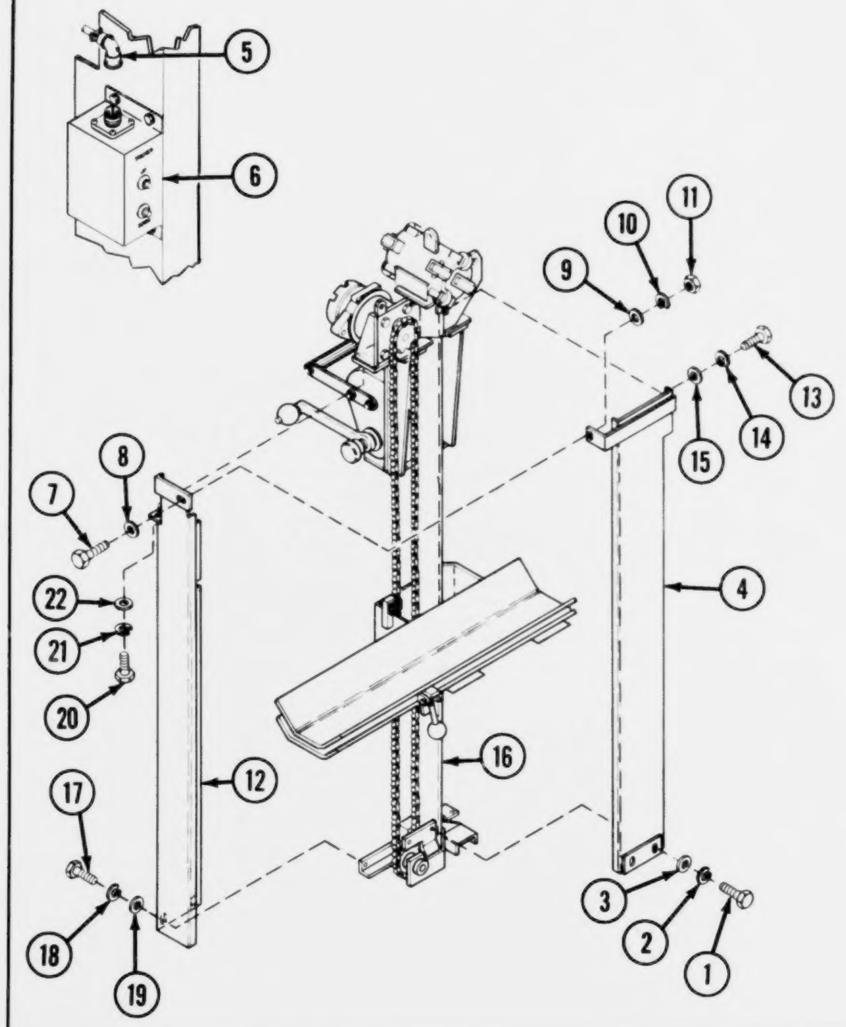
U Install stacker control switch box (2) with four screws (3) and four new lockwashers (4).

V Connect electrical connector (1) to stacker control box (2).



TA57491

OUTER AND INNER GUARDS: REMOVAL AND INSTALLATION



REMOVAL

A Remove two screws (1), two lockwashers (2) and two flat washers (3) from bottom of inner guard (4).

B Lower stacker tray fully (TM 9-2350-267-10).

C Disconnect electrical plug (5) from stacker control switch (6).

D Remove screw (7), two flat washers (8 and 9), lockwasher (10) and nut (11) that secure inner guard (4) and outer guard (12).

E Remove screw (13), lockwasher (14) and flat washer (15) that secure inner guard (4) to vertical stacker support (16).

F Remove inner guard (4) from stacker assembly.

G Remove two screws (17), two lockwashers (18) and two flat washers (19) from bottom of outer guard (12).

H Remove screw (20), lockwasher (21) and flat washer (22) that secures outer guard (12) to support bracket.

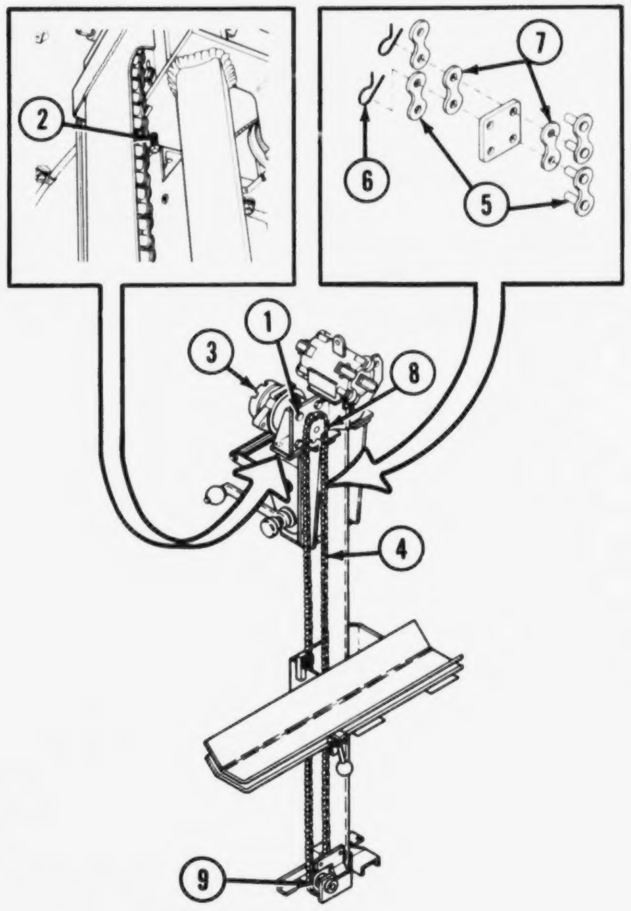
I Remove outer guard (12) from stacker assembly.

INSTALLATION

Reverse order of removal procedures.

TA310231

ROLLER CHAIN: REMOVAL AND INSTALLATION



REMOVAL

A Lower sliding tray (TM 9-2350-267-10).

B Remove inner and outer guards (p 12-31).

C Loosen four screws (1) and setscrew (2), and lower motor drive assembly (3), releasing tension on roller chain (4).

D Remove two master links (5) from carrier by removing four cotter pins (6), and remove two connecting links (7).

E Remove chain (4) from around drive sprocket (8) and idler sprocket (9).

INSTALLATION

Reverse order of removal procedures. Adjust chain tension (TM 9-2350-267-10).

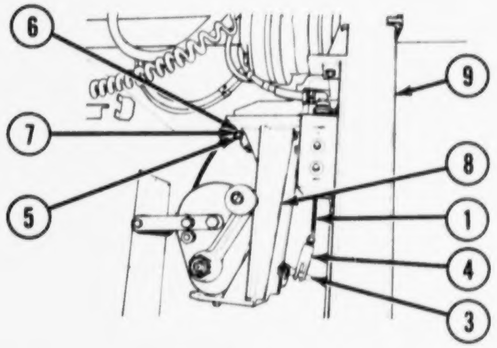
TA310232

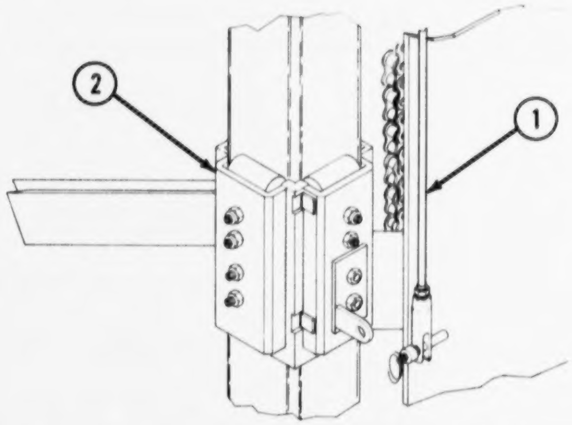
WINCH ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipmment/Special Tools:

Vise-jaws caps (item , Appx G)
Machinists vise (item , Appx G)





Materials/Parts:

Lubricating grease (item 27, Appx D)
Wiping rag (item 50, Appx D)

References:

TM 9-2350-267-10

REMOVAL

A Remove inner and outer guards (p 12-31).

WARNING

If winch cable (1) is supporting weight of carrier (2), do step B. Falling carrier (1) could cause serious injury.

NOTE

If winch cable (1) is connected to, but not supporting carrier (2), do step C. If not, go to step D.

B Lay out cable (1) to lower carrier (2) to floor of vehicle (TM 9-2350-267-10).

C Remove quick-release pin (3) from winch cable clevis (4) and disconnect cable (1) from carrier (2).

D Remove four screws (5), four flat washers (6) and four lockwashers (7) that secure winch bracket (8) to stacker support (9). Discard lockwashers.

TA311876

CARRIER ASSEMBLY AND MOTOR SUPPORT BRACKET: REMOVAL, INSTALLATION AND ADJUSTMENT

INITIAL SETUP

Parts/Materials:

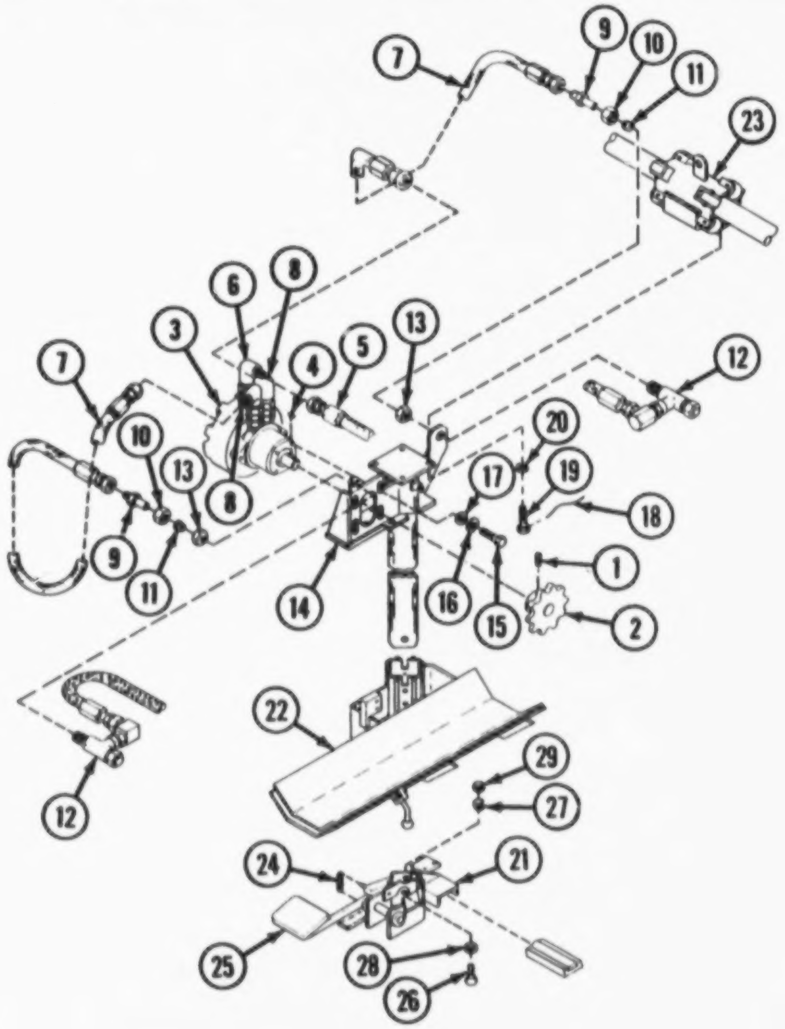
Wire, nonelectrical

Personnel Required:

Two

Equipment Condition:

Outer and inner stacker guards removed (p 12-31).
Winch assembly removed (p 12-33).
Roller chain removed (p 12-32).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TA57301

CARRIER ASSEMBLY AND MOTOR SUPPORT BRACKET: REMOVAL, INSTALLATION AND ADJUSTMENT (CONTINUED)

REMOVAL

WARNING

- Make sure all systems are shut down and MASTER switch if OFF. Hydraulic fluid may be HOT.
- Do not perform removal procedures until backup hydraulic gage has been visually checked. Gage must show 0 psi.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

NOTE

Note location of sprocket on motor shaft to ensure proper assembly.

A Loosen setscrew (1) and remove sprocket (2) from shaft of hydraulic motor (3).

B Remove key (4) from shaft of motor (3).

NOTE

Note location and routing of hoses before removal to ensure proper installation.

C Disconnect hose (5) from elbow (6).

D Disconnect two hoses (7) from two elbows (8) and reducers (9).

E Remove two reducers (9), two nuts (10) and two sleeves (11) as assemblies from two tee assemblies (12) by turning nuts (13).

F Remove two nuts (13) and pull two tee assemblies (12) from support bracket (14).

G While helper holds hydraulic motor (3), remove four screws (15), four lockwashers (16), four flat washers (17), and hydraulic motor (3) from support bracket (14). Discard lockwashers. Cut and discard lockwire.

H Cut and discard lockwasher (18).

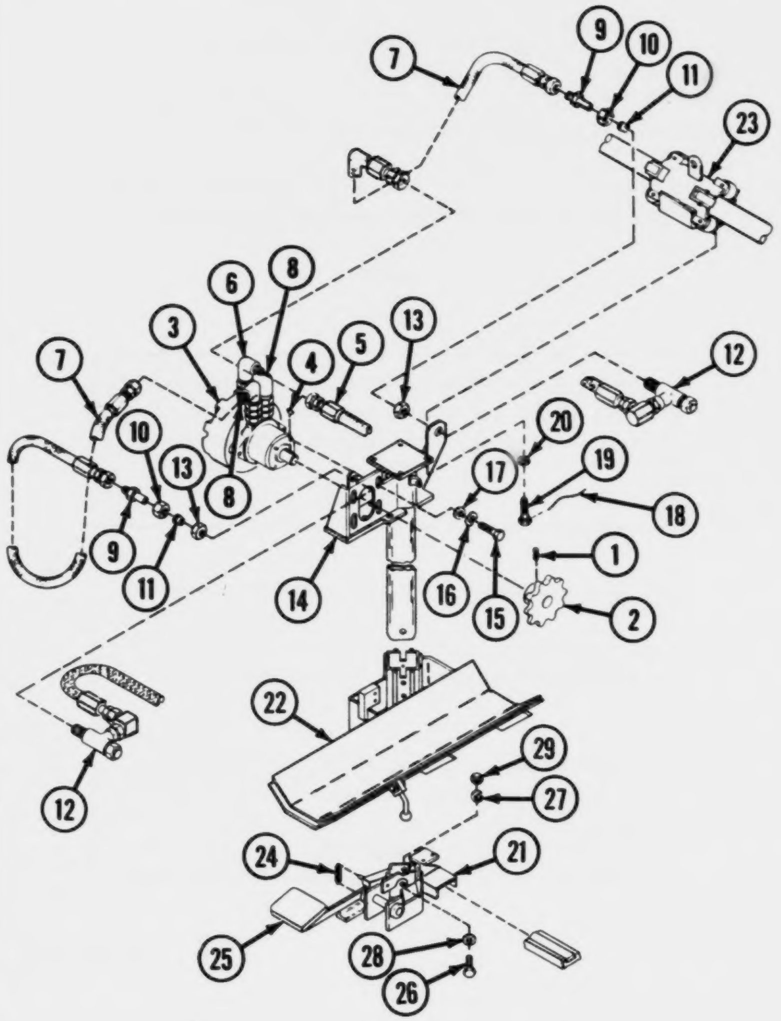
I Remove four screws (19) and four lockwashers (20) to remove support bracket (14), foot brake assembly (21) and carrier assembly (22) as an assembly from roller assembly (23). Have helper assist to move assembly to suitable work place. Discard lockwashers.

J Remove spring (24) and position foot pedal (25) to remove screw (26), lockwasher (27), flat washer (28) and nut (29), and remove foot brake assembly (21) from support bracket (14). Discard lockwasher.

K Slide carrier assembly (22) off support bracket (14).

TA57312

CARRIER ASSEMBLY AND MOTOR SUPPORT BRACKET: REMOVAL, INSTALLATION AND ADJUSTMENT (CONTINUED)



INSTALLATION

A Slide carrier assembly (22) onto support bracket (14).

B Install foot brake assembly (21) on support bracket (14), and position foot pedal (25) to install screw (26), new lockwasher (27), flat washer (28) and nut (29).

C Install spring (24)

D Install support bracket (14), foot brake assembly (21) and carrier assembly (22) as an assembly on roller assembly (23) using four screws (19) and four new lockwashers (20). Install new lockwire (18) on screws (19).

E Install hydraulic motor (3) on support bracket (14) with four screws (15), four new lockwashers (16) and four flat washers (17).

F Install two tee assemblies (12) on support bracket (14) with two nuts (13).

G Install two reducers (9), two nuts (10) and two sleeves (11) as assemblies on two tee assemblies (12), by turning nuts (13).

H Connect two hoses (7) to two elbows (8) and two reducers (9).

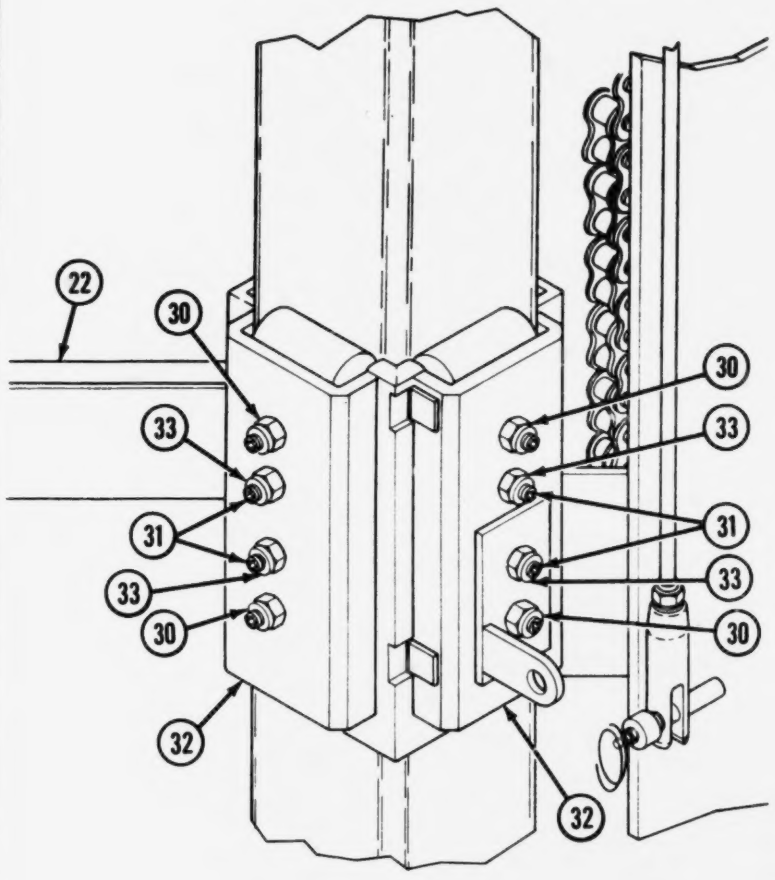
I Connect hose (5) to elbow (6).

J Install key (4) on shaft of motor (3).

K Install sprocket (2) on shaft of hydraulic motor (3) and tighten setscrew (1).

TA57274

CARRIER ASSEMBLY AND MOTOR SUPPORT BRACKET: REMOVAL, INSTALLATION AND ADJUSTMENT (CONTINUED)



ADJUSTMENT

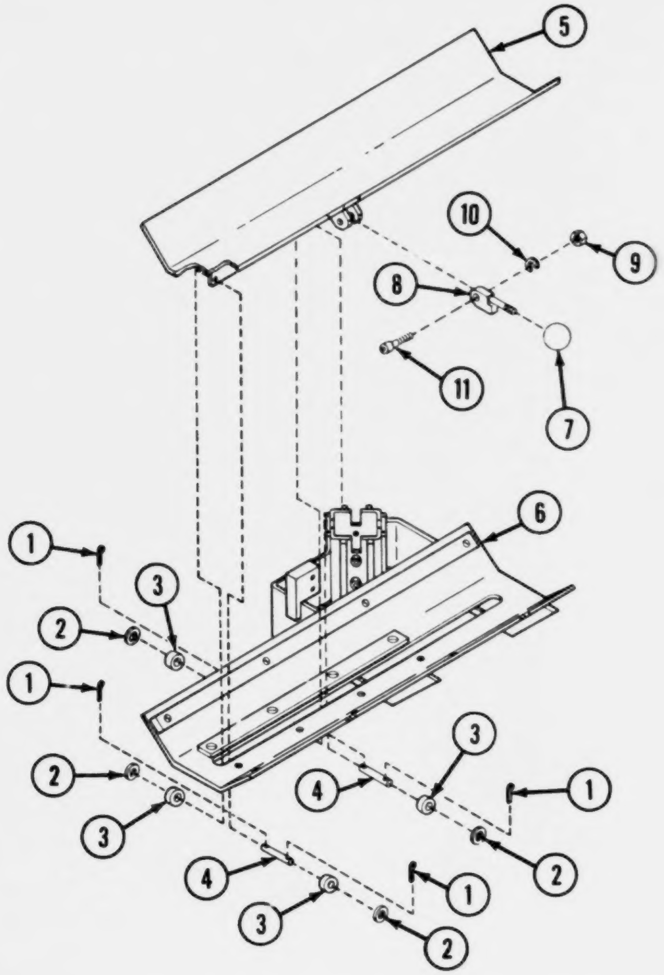
A Loosen two nuts (30) and adjust two setscrews)31) in each of two outer roller bearing retainers (32) to allow smooth, but firm up/down travel of carrier assembly (22).

B After adjustment, tighten two nuts (30) to secure each of two bearing retainers on carrier (22).

C Secure four setscrews (31) with four jamnuts (33).

TA57275

SLIDING TRAY ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove four cotter pins (1), four washers (2), four roller bearings (3) and two pins (4) from tabs at bottom of sliding tray assembly (5).

B Lift sliding tray assembly (5) from carrier (6).

DISASSEMBLY

A Unscrew knob (7) from handle (8).

B Remove nut (9), lockwasher (10) and bolt (11) securing handle (8) to sliding tray (5).

ASSEMBLY

Reverse disassembly procedures.

INSTALLATION

A Place sliding tray (5) on carrier (6) so that tab on tray bottom protrudes through slot in carrier.

B Place two pins (4) through tray tab and two roller bearings (3) on either side. Then secure both ends of each pin with one washer (2) and one cotter pin (1).

TA310236

STACKER CARRIER SLIDE BARS AND GUIDES: REMOVAL AND INSTALLATION

REMOVAL

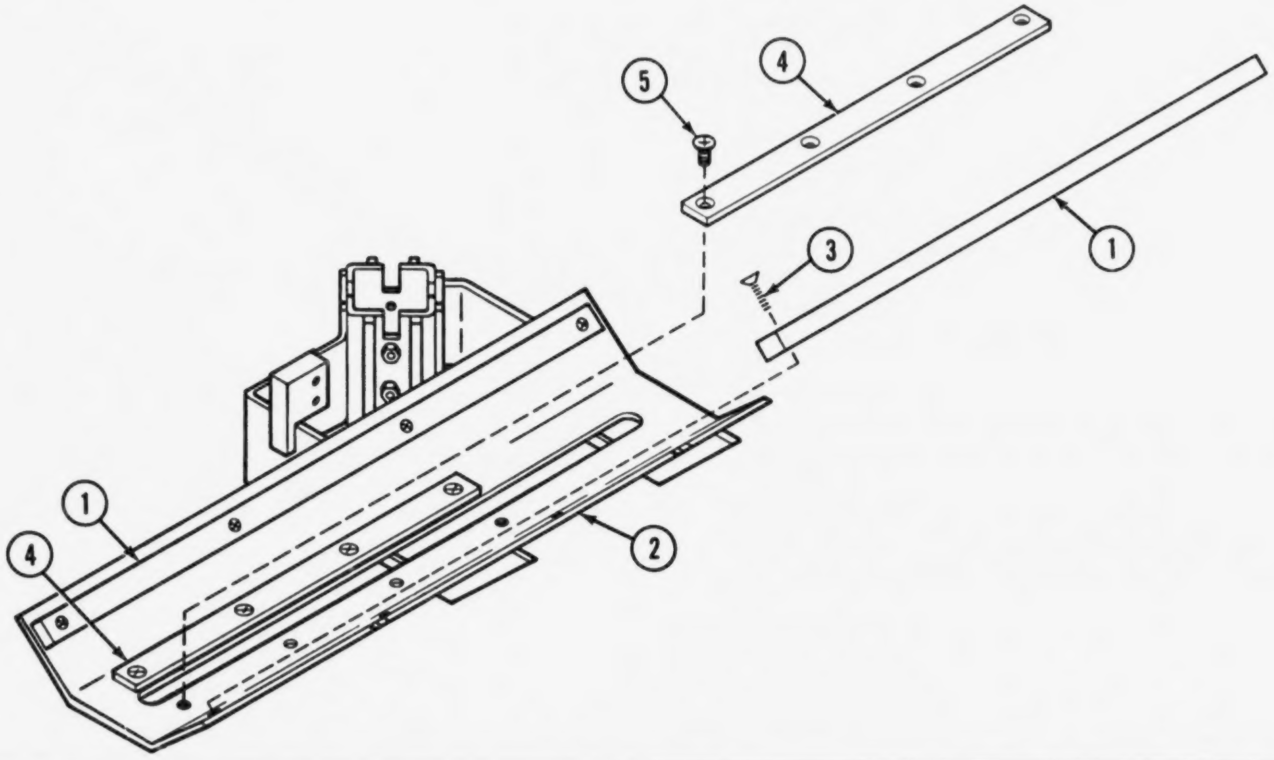
A Remove sliding tray assembly (p 12-36).

B Remove two slide bars (1) from carrier (2) by removing eight screws (3).

C Remove two guides (4) from carrier (2) by removing eight screws (5).

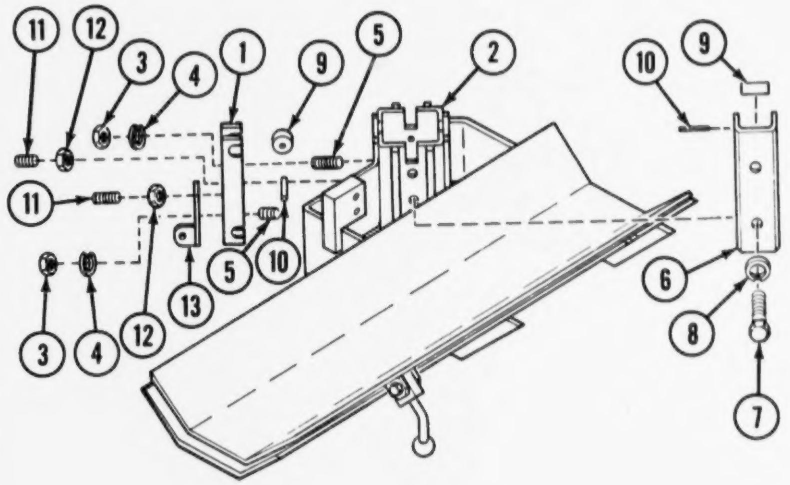
INSTALLATION

Reverse order of removal procedures.



TA310237

CARRIER ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove two outer bearing support retainer assemblies (1) from carrier assembly (2) by removing from each, two nuts (3) and two lockwashers (4) from two studs (5).

B Remove two inner bearing support retainer assemblies (6) from carrier assembly (2) by removing from each, two screws (7) and two lockwashers (8).

C Remove from each retainer assembly, two roller bearings (9) and two shafts (10).

D Remove from both outer retainer assemblies (1), two adjusting screws (11) and two jam nuts (12).

E Remove from one outer retainer assembly (1), cable attachment (13).

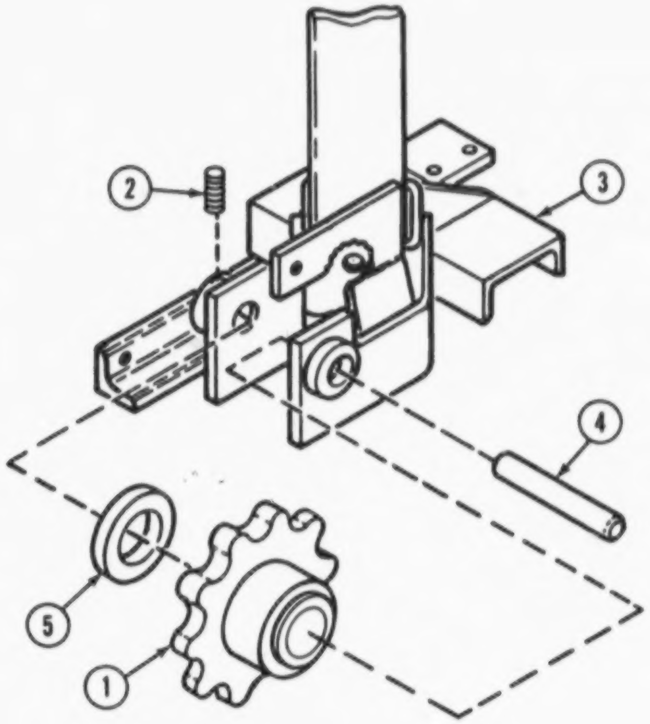
ASSEMBLY

A At installation, loosen two nuts (3) and adjust two setscrews (11) in each of two outer roller bearing retainers (1) to allow smooth, but firm up/down travel of carrier assembly (2). After adjustment, tighten two nuts (3) to secure each of two roller bearing retainers on carrier (2). Secure four setscrews (11) with four jam nuts (12).

B Reverse disassembly procedures.

TA310238

IDLER SPROCKET ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

A Remove roller chain from around idler sprocket (1) (p 12-32).

NOTE

Hook winch assembly cable to carrier tray and raise carrier to gain access to idler sprocket assembly (TM 9-2350-267-10).

B Remove setscrew (2) from idler sprocket support bracket (3).

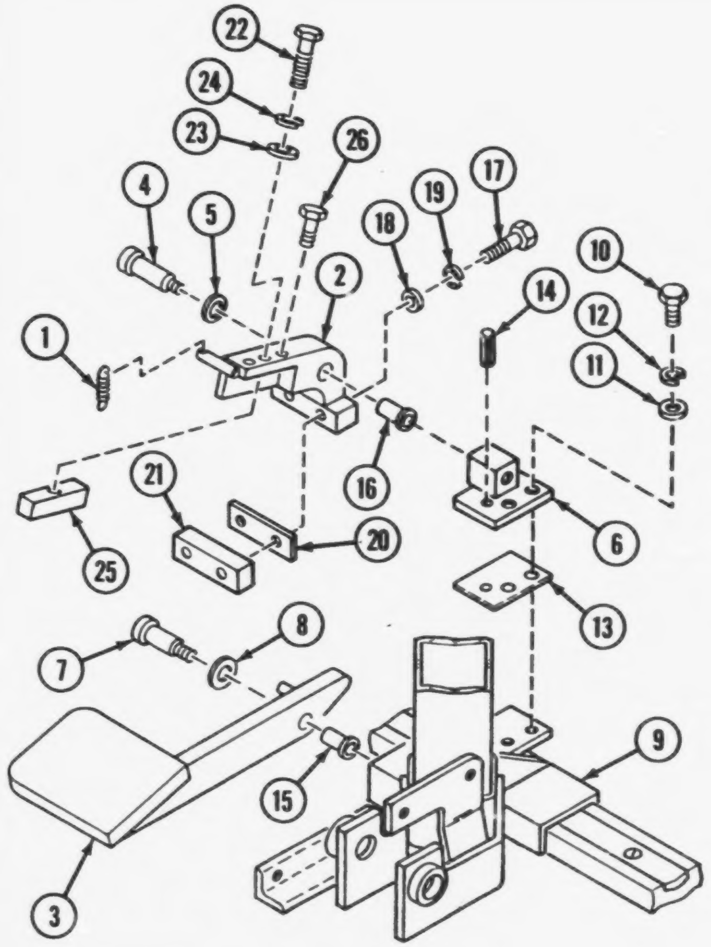
C Tap shaft (4) out of idler sprocket assembly and support bracket (3), and remove shaft (4), sprocket and bearing (1) and spacer (5).

INSTALLATION

Reverse removal procedures.

TA310239

STACKER FOOT BRAKE: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT



REMOVAL

A Remove spring (1) from brake arm (2) and brake pedal (3).

B Remove screw (4), flat washer (5), and brake arm (2) from pivot block (6).

C Remove screw (7), flat washer (8) and brake pedal (3) from idler sprocket support (9).

D Remove two screws (10), two flat washers (11), and two lockwashers (12) that secure pivot block (6) and shim (13) to idler sprocket support (9). Discard lockwashers.

E Remove spring pin (14) using punch and hammer. Discard spring pin.

DISASSEMBLY

A Remove pedal assembly bearing (15) from brake pedal (3), and arm assembly bearing (16) from brake arm (2).

NOTE

Record number and location of flat washers used to shim rack base to ensure proper installation.

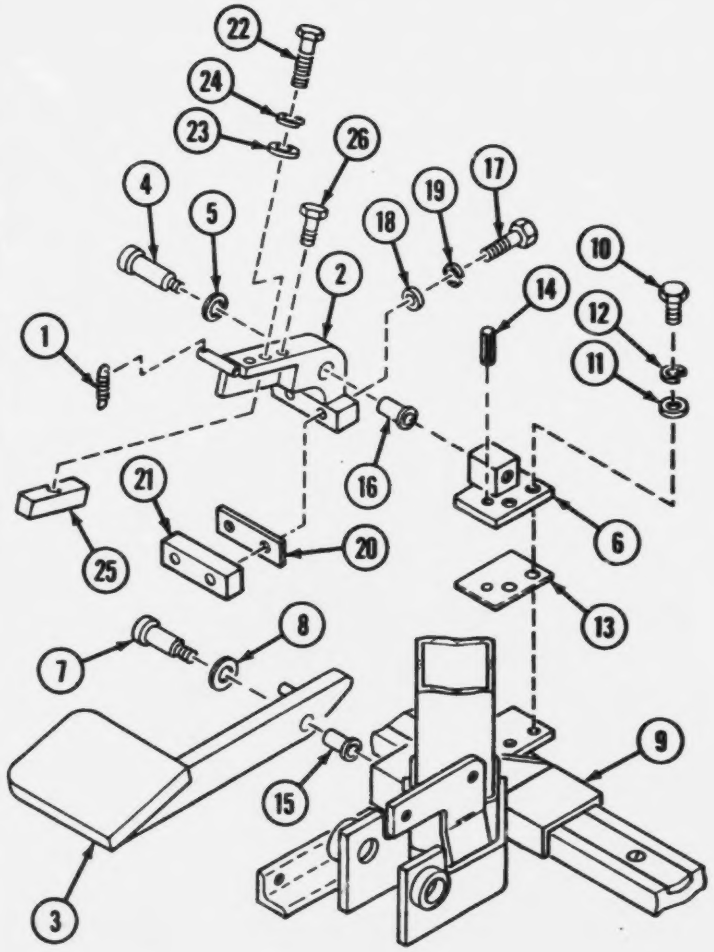
B Remove two screws (17), two flat washers (18), two lockwashers (19), shims (20) (if applicable) and brake pad (21) from brake arm (2). Discard lockwashers.

C Remove screw (22), flat washer (23), lockwasher (24), and adjusting block (25) from brake arm (2). Discard lockwasher.

D Remove two adjusting screws (26) from brake arm (2).

TA57480

STACKER FOOT BRAKE: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



ASSEMBLY

A Install assembly bearings (15 and 16) in pedal (3) and brake arm (2).

B Install two adjusting screws (26) in brake arm (2).

C Install adjusting block (25) on brake arm (2) with screw (22), new lockwasher (24) and flat washer (23).

D Install brake pad (21) and shims (20) (if applicable) on brake arm (2) with two screws (17), two new lockwashers (19) and two flat washers (18).

INSTALLATION

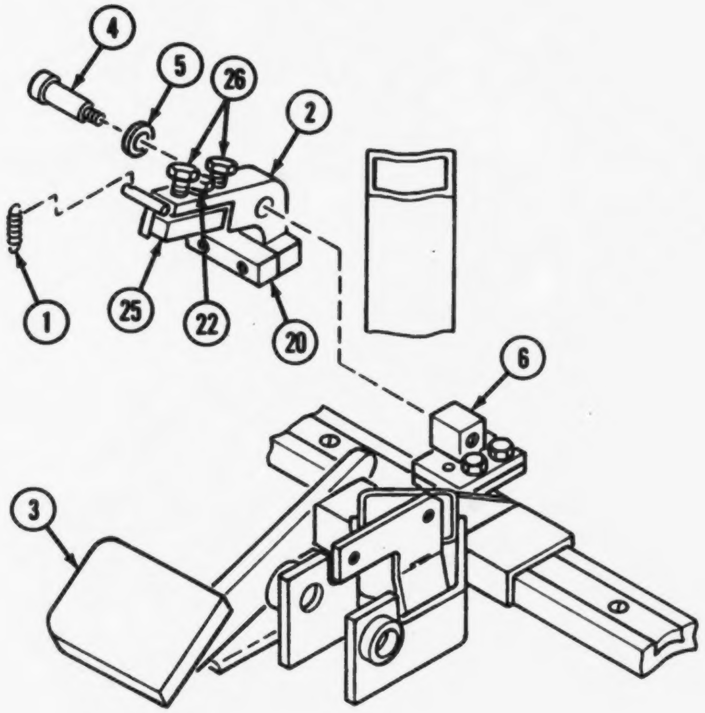
A Install shim (13) and pivot block (6) on idler sprocket support (9) with two screws (10), two new lockwashers (12) and two flat washers (11).

B Install new spring pin (14).

C Install brake pedal (3) on idler sprocket support (9) and secure with screw (7) and flat washer (8).

TA57481

STACKER FOOT BRAKE: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION AND ADJUSTMENT (CONTINUED)



D Install brake arm (2) on pivot block (6) and secure with screw (4) and flat washer (5).

E Install spring (1) on brake arm (2) and brake pedal (3).

ADJUSTMENT

A Back off screw (22) enough to allow free play in adjusting block (25).

NOTES

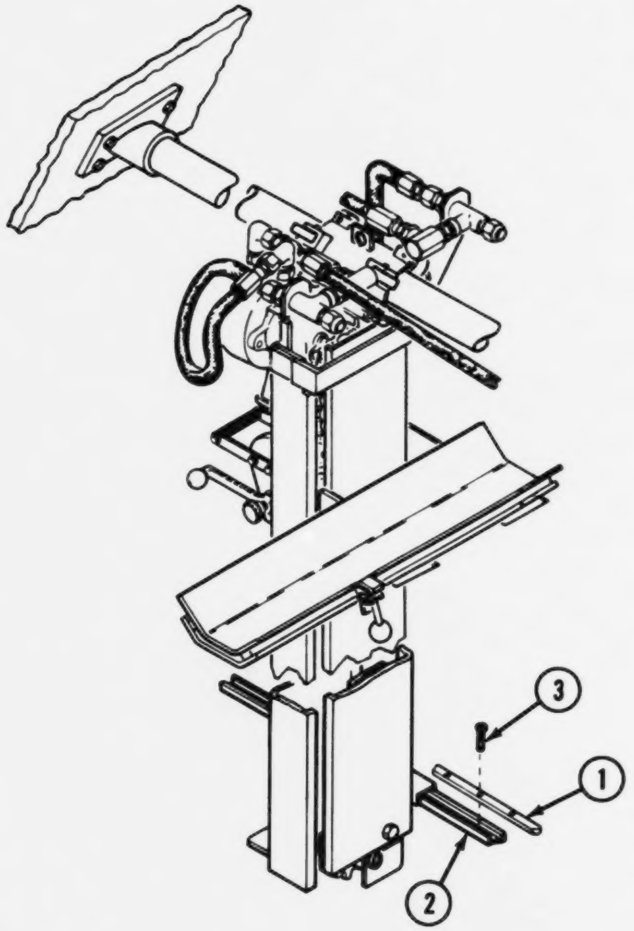
- It may be necessary to use longer adjusting screws and more shims. Adjusting screws should be turned equally so adjusting block will not be cocked in brake arm.
- Turning two adjusting screws clockwise will decrease travel of brake pad to wear strip.

B Turn two adjusting screws (26) to position adjusting block (25) to hold stacker when brake pedal (3) is depressed.

C After proper adjustment is achieved, secure adjusting block (25) to brake arm (2) by tightening screw (22).

TA57482

STACKER WEAR STRIP: REMOVAL AND INSTALLATION



NOTE

Move stacker to right and left to gain access to all seven lockscrews.

REMOVAL

Remove wear strip (1) and wear strip plate (2) by removing seven lockscrews (3) that secure wear strip and wear strip plate to vehicle floor. Discard lockscrews.

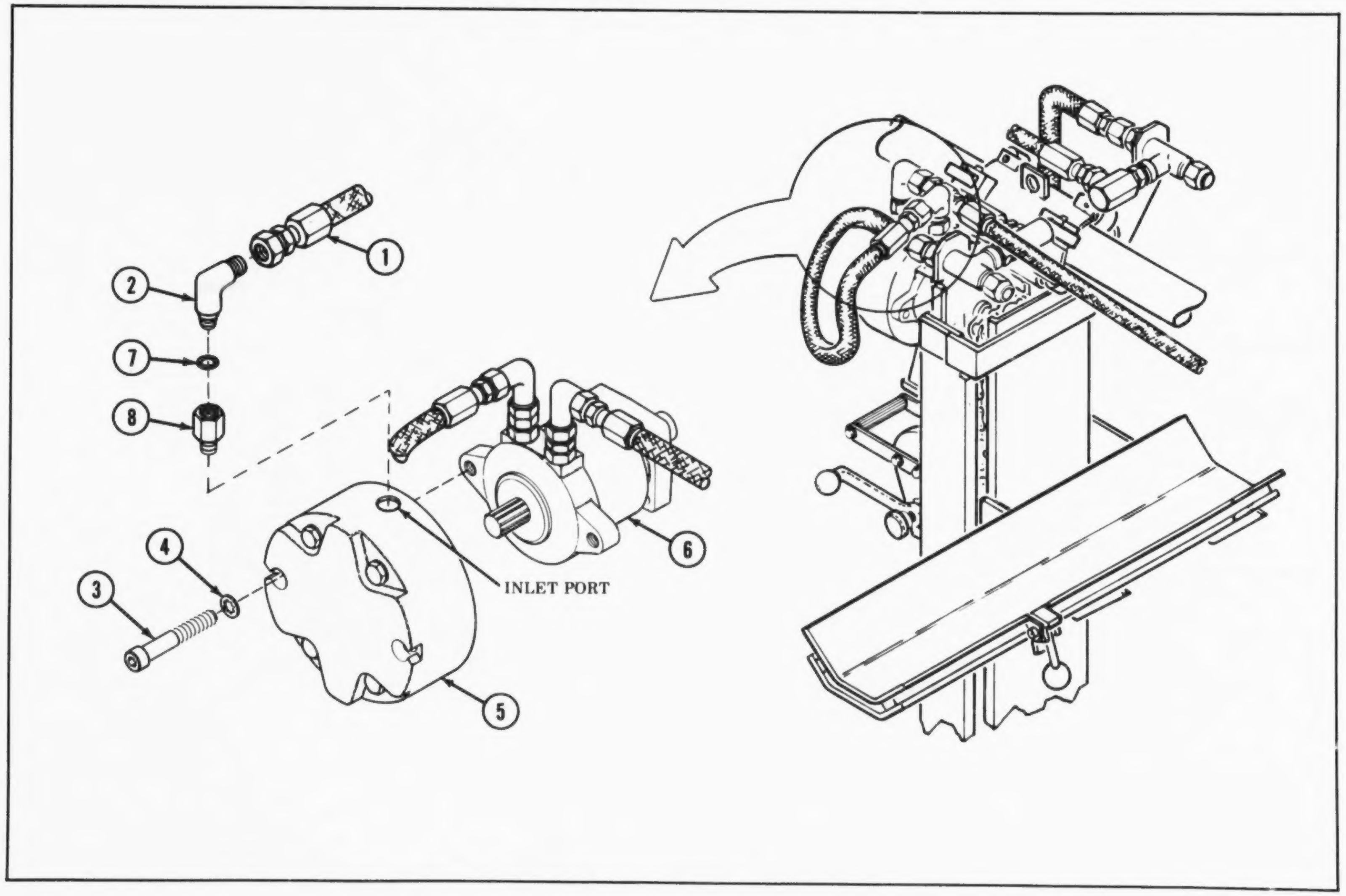
INSTALLATION

A Install wear strip (1) and wear strip plate (2) with seven new lockscrews (3).

B Adjust stacker brake pedal as described in adjustment, stacker brake pedal assembly (p 12-40.2)

TA57483

STACKER HYDRAULIC BRAKE: REMOVAL AND INSTALLATION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INLET PORT

TA313048

STACKER HYDRAULIC BRAKE: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

WARNINGS

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

Do not perform removal of procedures until backup hydraulic gage has been checked visually. Gage must show 0 psi.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

A Disconnect hydraulic hose (1) from elbow (2).

B Remove two screws (3) and two lockwashers (4). Discard lockwashers.

C Pull brake (5) from motor (6).

D Remove elbow (2), packing (7) and expander (8) from brake (5). Discard packing.

INSTALLATION

A Install expander (8), new packing (7) and elbow (2) on brake (5).

B Position brake (5) on motor (6) and turn brake (5) until screw mounting holes aline.

C Secure brake (5) on motor (6) with two screws (3) and two new lockwashers (4).

D Connect hydraulic hose (1) to elbow (2).

TA313049

HYDRAULIC MOTOR AND DRIVE SPROCKET: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

Teflon tape (item 62, Appx D)

Personnel Required:

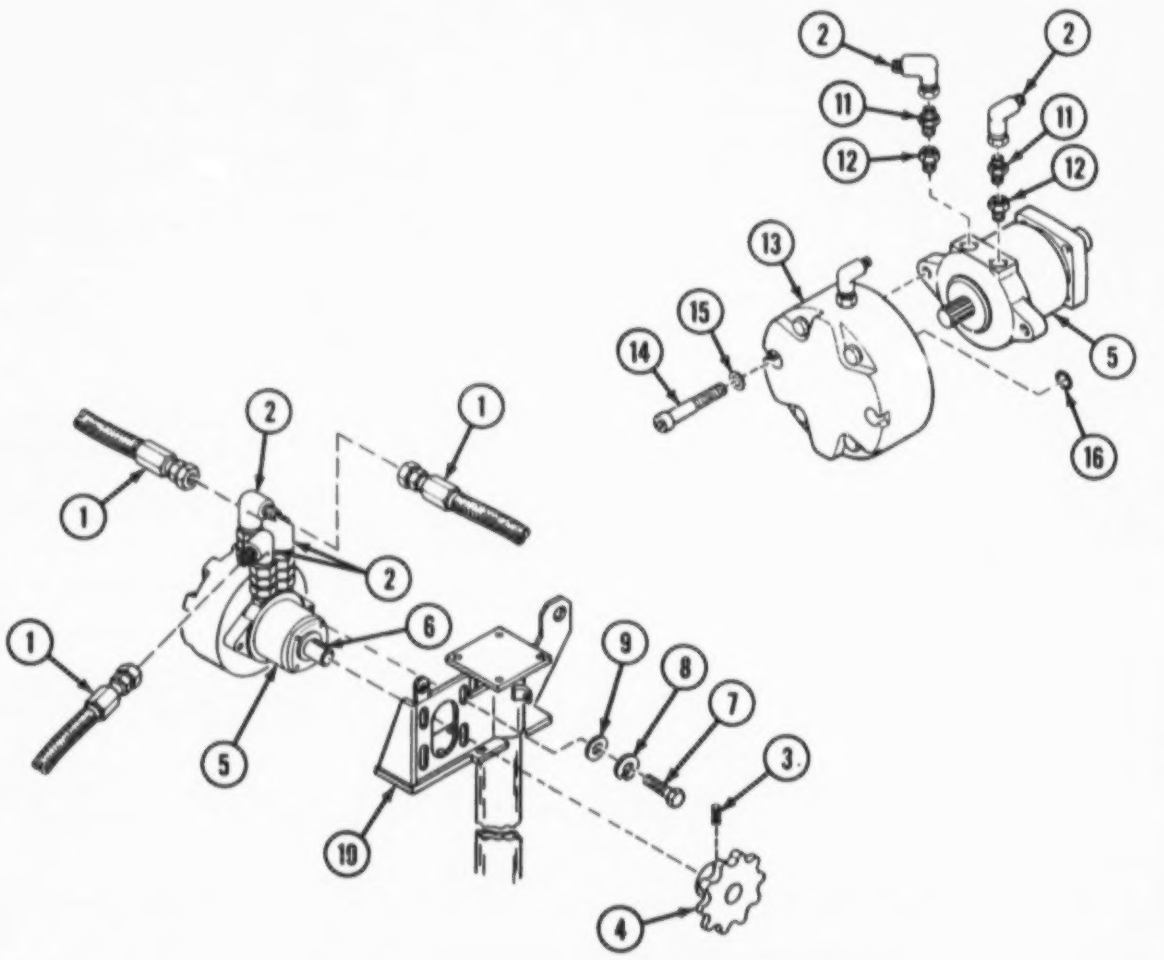
Two

References:

TM 9-2350-267-10
LO 9-2350-267-12

Equipment Condition:

Roller chain removed (p 12-32).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TA57484

REMOVAL

WARNING

- Make sure all systems are shut down and MASTER switch if OFF. Hydraulic fluid may be HOT.
- Do not perform removal procedures until backup hydraulic gage has been visually checked. Gage must show 0 psi.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

NOTE

Tag lines for proper installation.

A Disconnect three hydraulic lines (1) from three elbows (2).

NOTE

Note location of sprocket on shaft to ensure proper assembly.

B Loosen setscrew (3) and tap sprocket (4) free from shaft of motor (5).

C Remove key (6) from shaft of motor (5).

D Remove four screws (7), four lockwashers (8), four flat washers (9), and motor (5) from support bracket (10). Discard lockwashers.

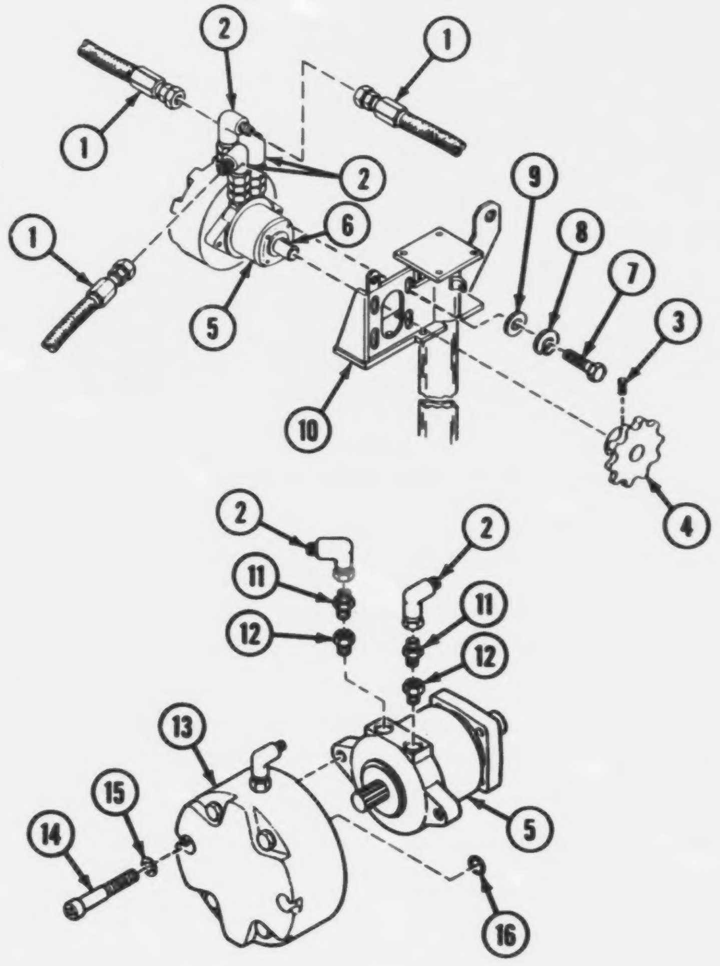
E Remove two elbows (2), two adapters (11) and two adapters (12) from motor (5).

F Separate brake (13) from motor (5) by removing two screws (14) and two lockwashers (15). Discard lockwashers.

G Remove and discard packing (16).

TA57485

HYDRAULIC MOTOR AND DRIVE SPROCKET: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install new packing (16).

B Install brake (13) on motor (5) with two screws (14) and two new lockwashers (15).

NOTE

Apply Teflon tape (item 62, Appx D) to all male pipe threads prior to installation.

C Install two adapters (12), two adapters (11) and two elbows (2) on motor (5).

D Install motor (5) on support bracket (10) with four screws (7), four new lockwashers (8) and four flat washers (9).

E Install key (6) in shaft of motor (5).

F Install sprocket (4) on shaft of motor (5), hub side first, alining key (6) to slotted groove.

G Tighten setscrew (3).

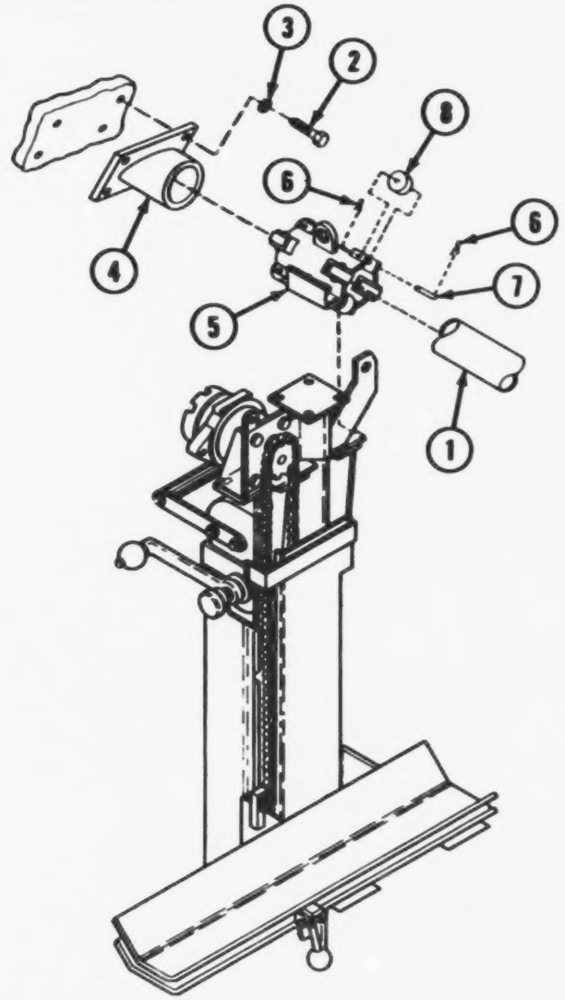
H Connect three hydraulic lines (1) to three elbows (2).

I Check hydraulic fluid level in reservoir and add if necessary (LO 9-2350-267-12).

J Activate APU and operate stacker controls to check motor operation (TM 9-2350-267-10).

TA57486

SUPPORT ASSEMBLY, UPPER CROSS MEMBER AND SUPPORT BRACKETS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



INITIAL SETUP

Materials/Parts:

Lubricating oil (item 35, Appx D)
Zinc chromate paste (item 46, Appx D)

Personnel Required:

Two

Equipment Condition:

Carrier assembly and motor support bracket removed (p 12-34).

REMOVAL

A Support upper crossmember (1) and remove four screws (2) and four lockwashers (3) from each of two support brackets (4). Discard lockwashers.

B Remove upper crossmember (1) from vehicle and remove two support brackets (4).

C Slide support assembly (5) from crossmember (1).

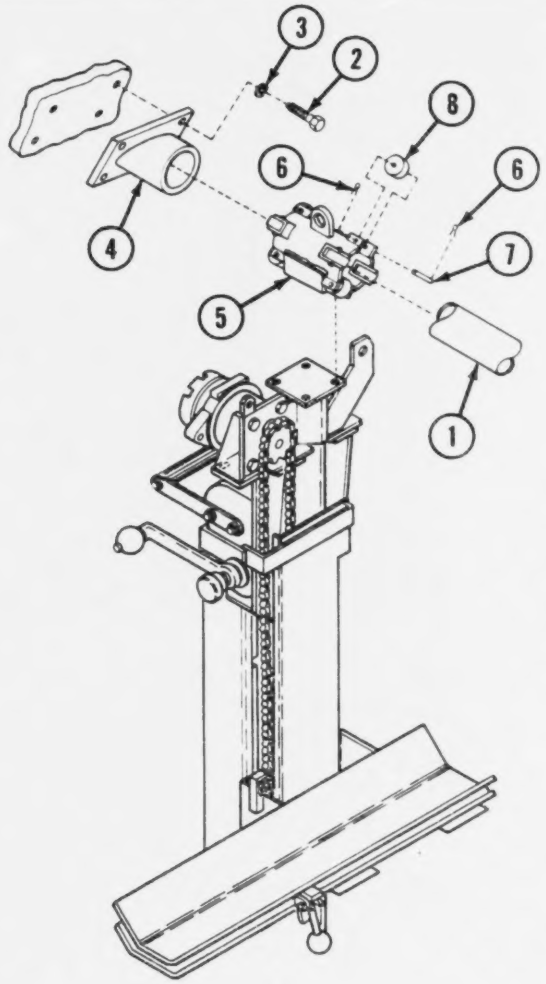
DISASSEMBLY

A Remove two cotter pins (6) from each of eight bearing shafts (7). Discard cotter pins.

B Remove eight bearing shafts (7) from support assembly (5). Remove eight cam followers (8).

TA57487

SUPPORT ASSEMBLY, UPPER CROSS MEMBER AND SUPPORT BRACKETS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Coat each of eight bearing shafts (7) lightly with lubricating oil (item 35, Appx D).

B Install each of eight cam followers (8) on support assembly (5) with bearing shaft (7) and two new cotter pins (6).

INSTALLATION

A Slide support assembly (5) onto crossmember (1).

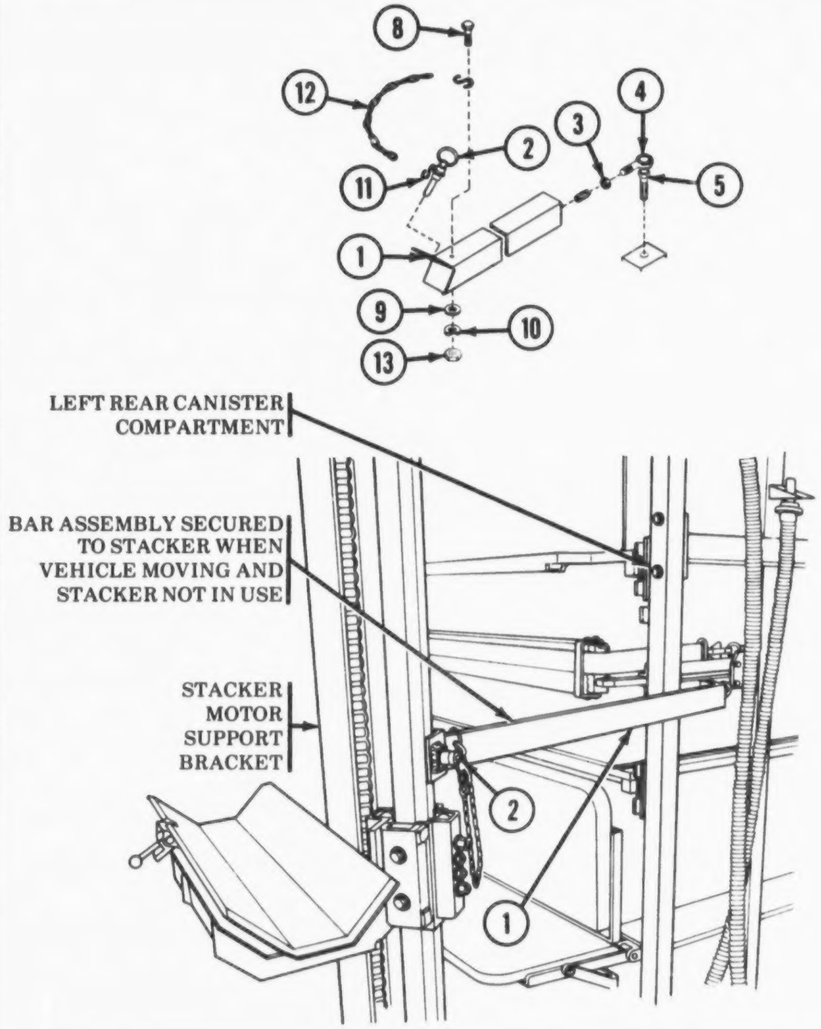
B Install two support brackets (4) on crossmember (1).

C Apply zinc chromate paste (item 46, Appx D) to mounting surfaces of two brackets (4) and vehicle ceiling.

D Support crossmember (1) and install support brackets (4) using four screws (2) and four new lockwashers (3).

TA57488

STACKER BAR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION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LEFT REAR CANISTER COMPARTMENT
BAR ASSEMBLY SECURED TO STACKER WHEN VEHICLE MOVING AND STACKER NOT IN USE
STACKER MOTOR SUPPORT BRACKET
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REMOVAL

A Disconnect bar assembly (1) from stacker motor support bracket by pulling quick-disconnect pin (2).

B Loosen jam nut (3) from flexible rod end (4).

C Remove nut (3) from flexible rod end (4).

D Turn nut (5) to remove flexible rod end (4) from left rear canister compartment cross member.

DISASSEMBLY

A Remove disconnect pin (2) from bar (1) by removing screw (8), flat washer (9), lockwasher (10) and nut (13).

B Remove chain (12) from disconnect pin by bending connecting link (11).

ASSEMBLY

Reverse order of disassembly procedures.

INSTALLATION

Reverse order of removal procedures.

TA310245

CHAPTER 13
AUXILIARY POWER UNIT (APU) MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter illustrates and describes organizational level maintenance procedures for the Auxiliary Power Unit (APU).

It consists of three sections:

Section I APU Removal and Installation
Section II APU Oil Filter
Section III APU Power Unit Control Box

Section I APU REMOVAL AND INSTALLATION

APU: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

Wrench, pipe, 18 in. (item 73, Appx B)

Materials/Parts:

Tape, pressure sensitive (item 60, Appx D)

Personnel Required:

Three

References:

TM 9-2350-267-10

REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

NOTE

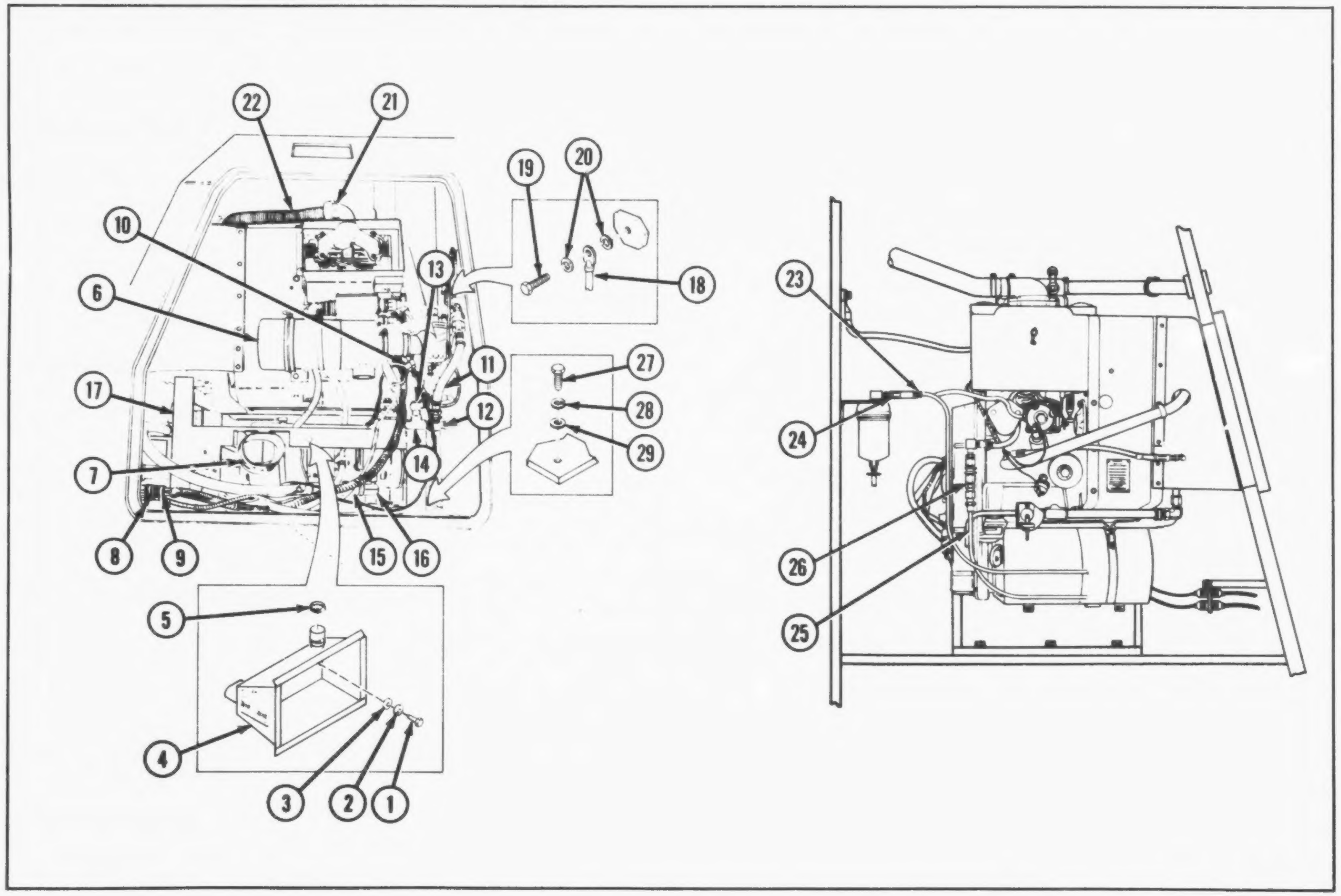
Cables, lines, tubes and harnesses which are disconnected for APU removal must be taped to sides of APU to prevent damage while APU is removed from compartment.

A Remove APU compartment access plate (p 13-13).

B Open APU compartment side door.

TA313055

APU: REMOVAL AND INSTALLATION (CONTINUED)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TA313056

APU: REMOV ND INSTALLATION (CONTINUED)

C Remove two screws (1), two lockwashers (2) and two flat washers (3) from air-intake plenum (4). Discard lockwashers.

D Remove one hose clamp (5) securing hose to air cleaner housing (6).

E Loosen plenum box generator hose clamp (7) and remove plenum (4) and attached air cleaner intake hose.

F Disconnect electrical wiring harness connectors (8 and 9) from APU compartment-wall connections.

G Disconnect two hydraulic pressure switch electrical connectors (10).

H Close hydraulic reservoir ball valve (p 16-3).

I Disconnect hydraulic pump outlet hose coupling (11) from elbow (12). Allow hose to drain into suitable container.

J Disconnect hydraulic pressure line (13) from hydraulic T-connection (14). Allow hose to drain into suitable container.

K Disconnect hydraulic pump inlet hose coupling (15) from elbow (16). Allow hose to drain into suitable container.

L Place hose through APU support stand (17) and allow hose to lie straight against forward APU compartment bulkhead.

M Disconnect ground lead (18) at bulkhead by removing screw (19) and two lockwashers (20). Discard lockwashers.

N Remove clamp (21) and tube assembly (22) from exhaust outlet. Remove and discard gasket (hidden). Push tube in upward position for clearance.

O Disconnect secondary filter outlet line (23) at quick-disconnect fitting (24).

P Disconnect fuel return line (25) at quick-disconnect coupling (26).

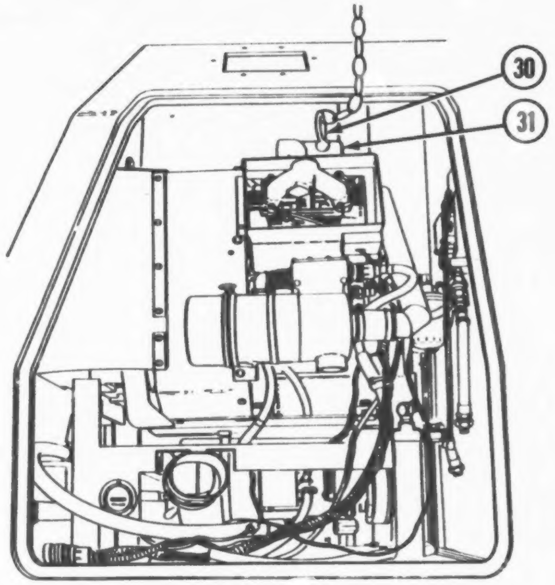
NOTE

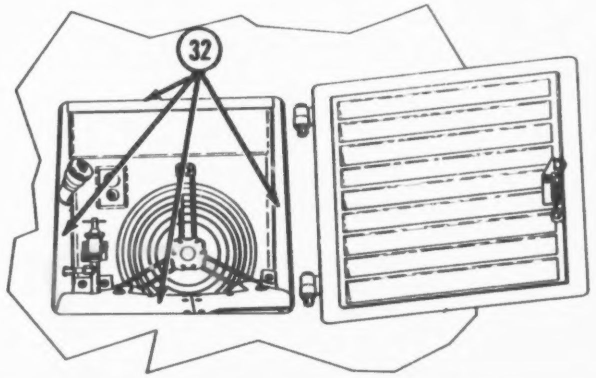
Pull fuel return line through opening and let hang inside vehicle. Also pull fuel filter drain hoses through APU support stand and allow to hang out of APU doorway.

Q Remove six screws (27), six lockwashers (28) and six flat washers (29) securing support stand (17) to APU compartment floor. Discard lockwashers.

TA313057

APU: REMOVAL AND INSTALLATION (CONTINUED)





R Secure clevis (30) to APU lifting bracket (31).

S Open APU front door and separate APU panels (32) at hook-and-pile fasteners

T Remove APU panels (32) (p 13-30).

WARNING

APU and APU compartment clearance is minimal. Use care at removal to avoid injury to hands and fingers.

CAUTION

Use care when removing APU from vehicle to prevent damaging cables, lines, tubes and harnesses.

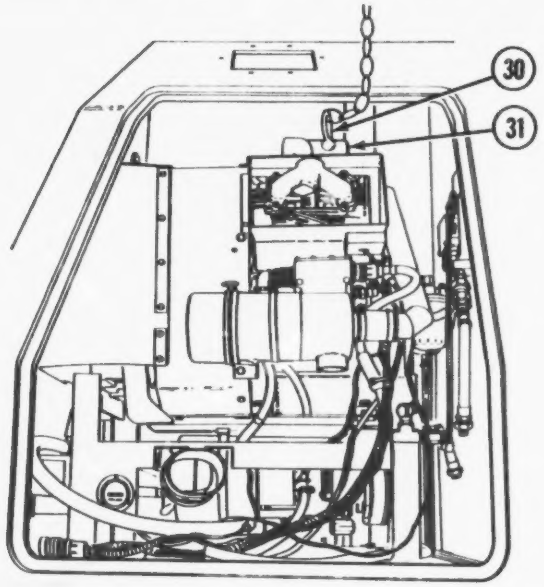
U Attach suitable lifting device to clevis (30).

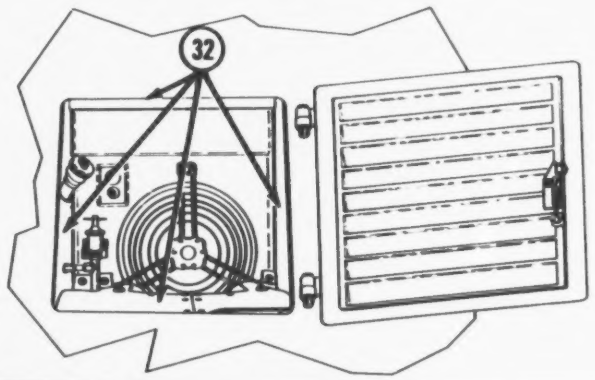
V Remove APU with attached support stand from APU compartment.

W Remove lifting device from clevis (30).

TA313058

APU: REMOVAL AND INSTALLATION (CONTINUED)





INSTALLATION

A Using suitable lifting device, install APU with attached support stand in APU compartment.

WARNING

APU and APU compartment clearance is minimal. Use care at installation to avoid injury to hands and fingers.

CAUTION

Use care when installing APU in vehicle to prevent damaging cables, lines, tubes and harnesses.

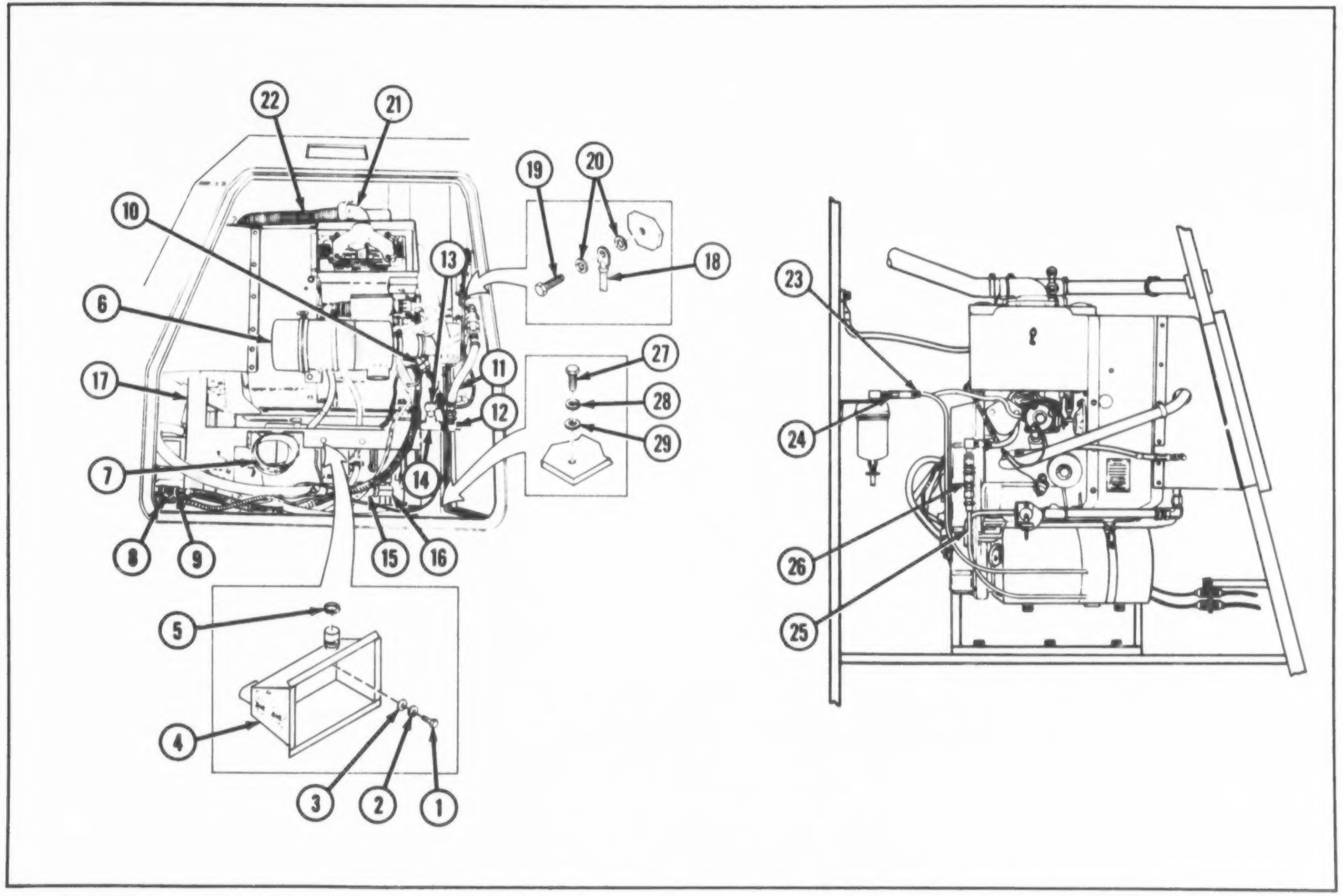
B Install APU panels (32) (p 13-32).

C Secure APU panels (32) at hook-and-pile fasteners and close APU front door.

D Remove clevis (30) from APU lifting bracket (31).

TA313059

APU: REMOVAL AND INSTALLATION (CONTINUED)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TA313060

APU: REMOVAL AND INSTALLATION (CONTINUED)

E Secure support stand (17) to APU compartment floor with six screws (27), six new lockwashers (28) and six flat washers (29).

F Connect fuel return line (25) at quick-disconnect coupling (26) and install lockring.

G Connect secondary filter outlet line (23) at quick-disconnect fitting (24) and install lockring.

H Install new gasket (hidden) and secure exhaust tube (22) to exhaust outlet with clamp (21).

I Connect ground lead (18) to bulkhead with screw (19) and two new lockwashers (20).

J Connect hydraulic pump inlet hose coupling (15) to elbow (16).

K Connect hydraulic pressure line (13) to hydraulic T-connectio (14).

L Connect hydraulic pump outlet hose coupling (11) to elbow (12).

M Open hydraulic reservoir ball valve (p 16-3).

N Connect two hydraulic pressure switch electrical connectors (10).

O Connect electrical wiring harness connectors (8 and 9) to APU compartment-wall connections.

P Start APU (TM 9-2350-267-10). Check for hydraulic leaks.

Q Install plenum (4) and attached air cleaner intake hose and secure with plenum box generator hose clamp (7).

R Secure air cleaner intake hose to air cleaner housing (6) with one hose clamp (5).

S Install air-intake plenum (4) with two screws (1), two new lockwashers (2) and two flat washers (3).

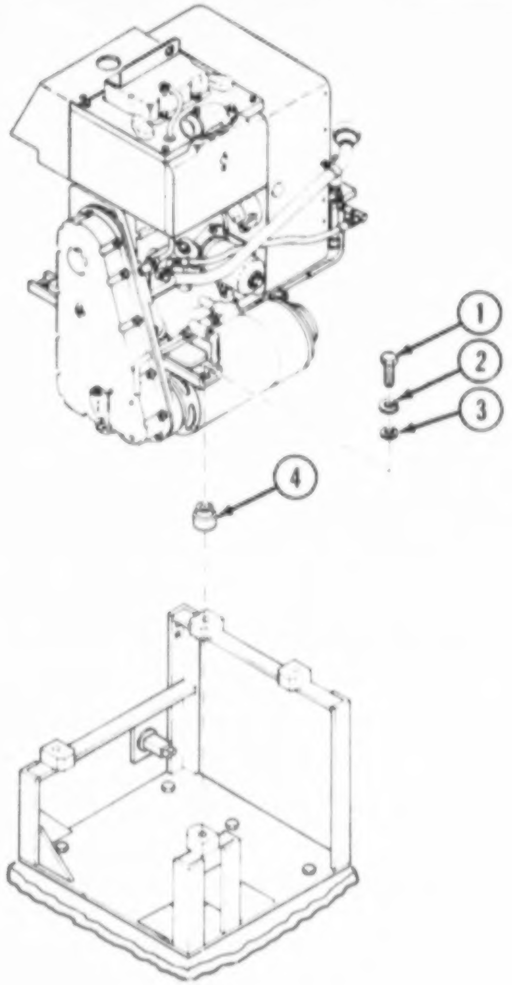
T Close APU compartment side door.

U Install APU compartment access plate (p 13-13).

V Connect battery ground leads.

TA313061

APU SUPPORT MOUNTS: REMOVAL AND INSTALLATION



NOTE

Remove APU compartment access plate (p 13-13) or open APU compartment side door as necessary to gain access to mounts.

REMOVAL

A Remove screw (1), lockwasher (2) and flat washer (3) at location where mount (4) is to be replaced. Discard lockwasher.

B Pry up support and engine enough to push mount (4) out of hole in support. Discard mount.

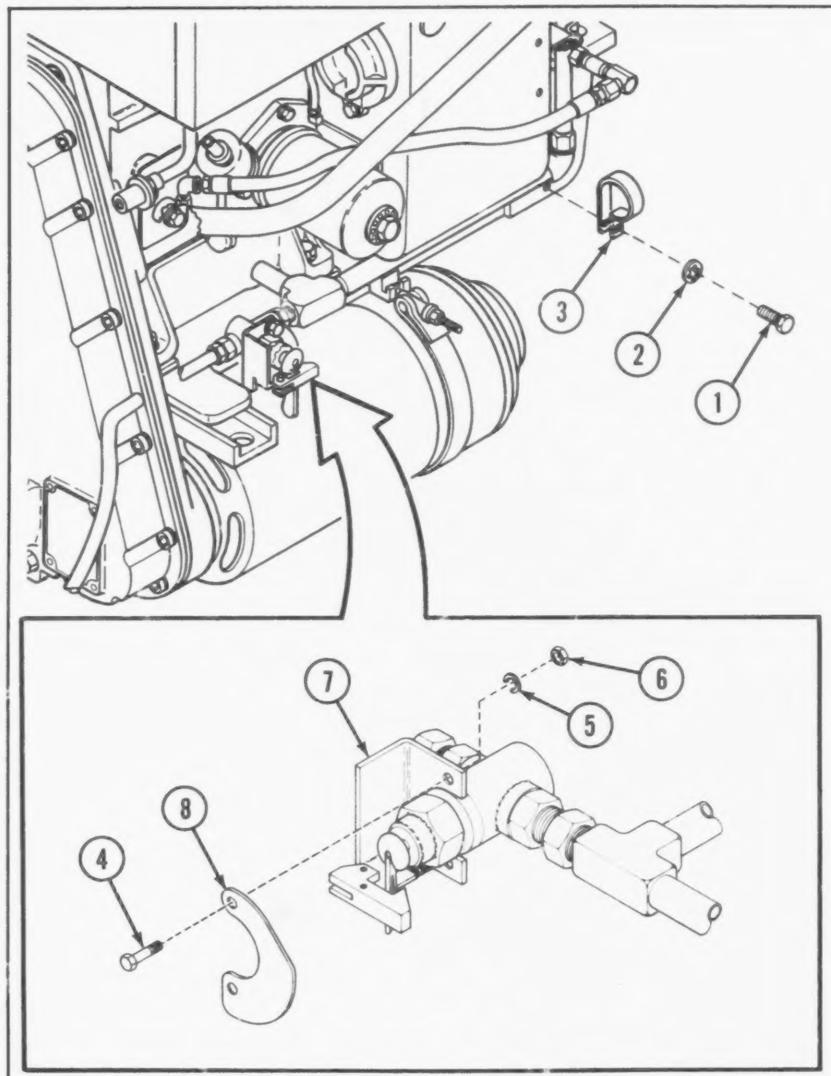
INSTALLATION

A Pry up support and engine enough to insert new mount (4) in hole in support.

B Install screw (1), new lockwasher (2) and flat washer (3) at location of new mount (4).

TA313062

APU ENGINE SUPPORT STAND AND SUPPORT ASSEMBLY: REMOVAL AND INSTALLATION



REMOVAL

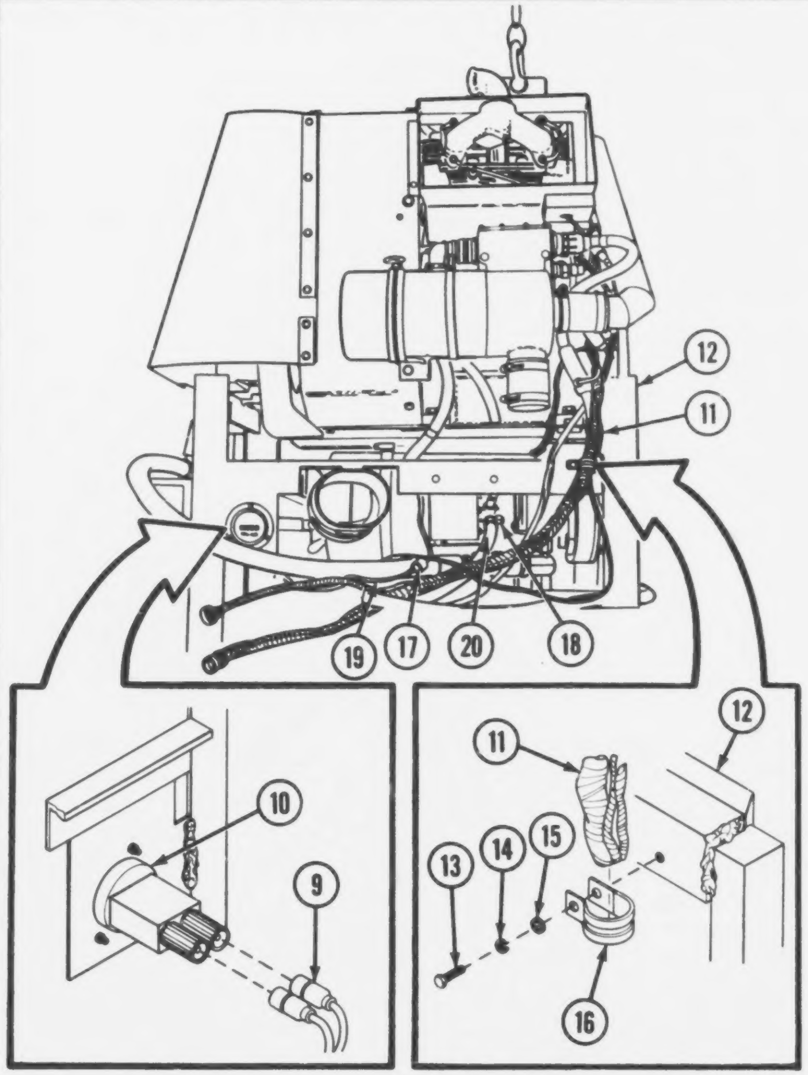
A Remove APU from vehicle (p 13-1).

B Remove screw (1), lockwasher (2) and clamp (3).

C Remove two screws (4), two lockwashers (5), two nuts (6), catch assembly (7) and data plate (8).

TA309951

APU ENGINE SUPPORT STAND AND SUPPORT ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



D Disconnect two electrical connections BY and BZ (9) from hour meter (10).

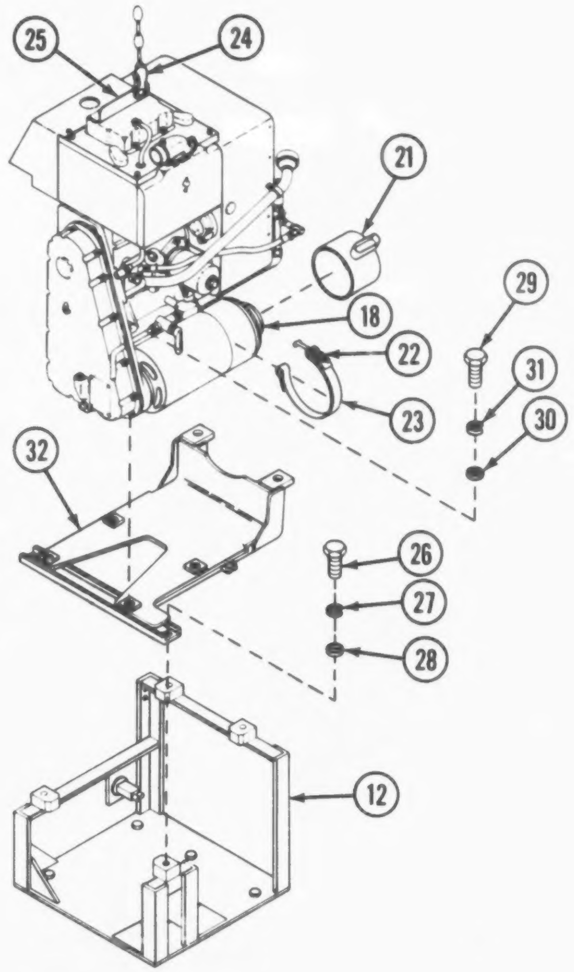
E Release electrical harnesses (11) from APU support stand (12) by removing screw (13), lockwasher (14), flat washer (15) and clamp (16).

F Disconnect GND lead connector (17) between generator (18) and wiring harness lead (19).

G Disconnect one electrical lead 62 (20) from generator (18) terminal B.

TA309952

APU ENGINE SUPPORT STAND AND SUPPORT ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



H Remove generator air duct (21) from generator (18) by turning nut (22) and releasing clamp (23).

I Attach lifting clevis (24) in APU lifting eye plate (25) and attach suitable lifting device to clevis.

J Remove four screws (26), four lockwashers (27) and four flat washers (28). Using suitable lifting device, lift APU from support stand (12).

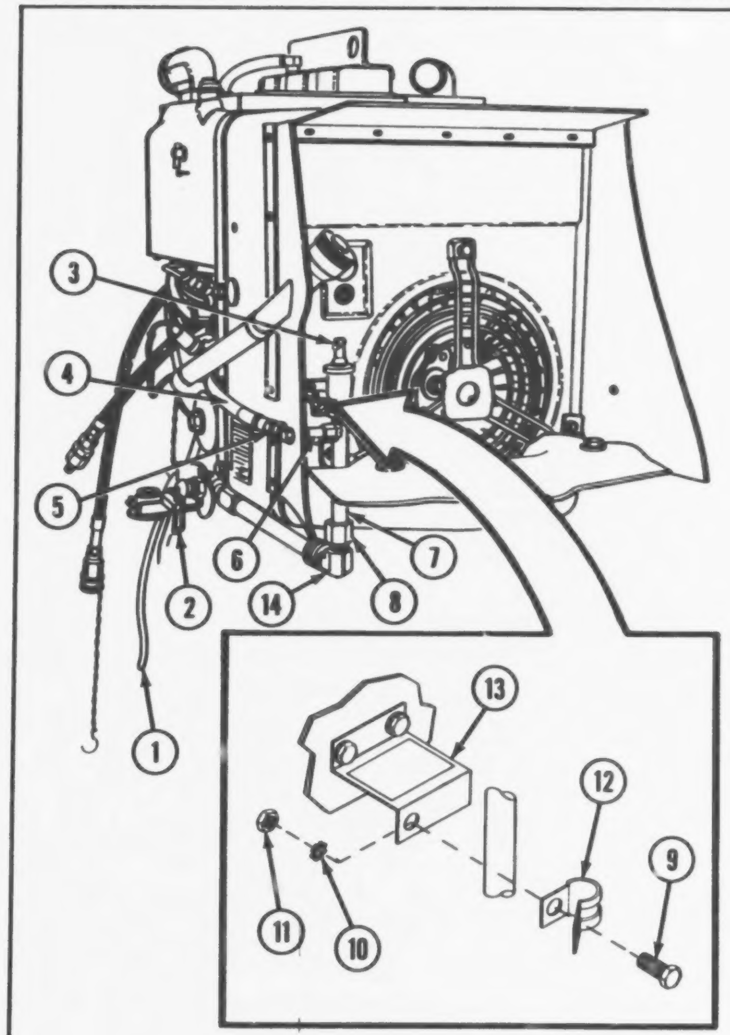
K Remove four screws (29), four flat washers (30) and four lockwashers (31) and remove support assembly (32) from APU.

INSTALLATION

Reverse removal procedures.

TA309953

APU OIL DRAIN TUBING AND FITTINGS: REMOVAL AND INSTALLATION



REMOVAL

A Remove engine support stand and support assembly from APU (p 13-5).

B Place suitable container under crankcase oil drain hose (1) and turn valve (2) to drain position.

C Drain and discard oil.

D Remove dipstick (3).

E Disconnect hose assembly (4) from adapter union (5).

F Remove adapter union (5) and nipple (6) from tube assembly (7).

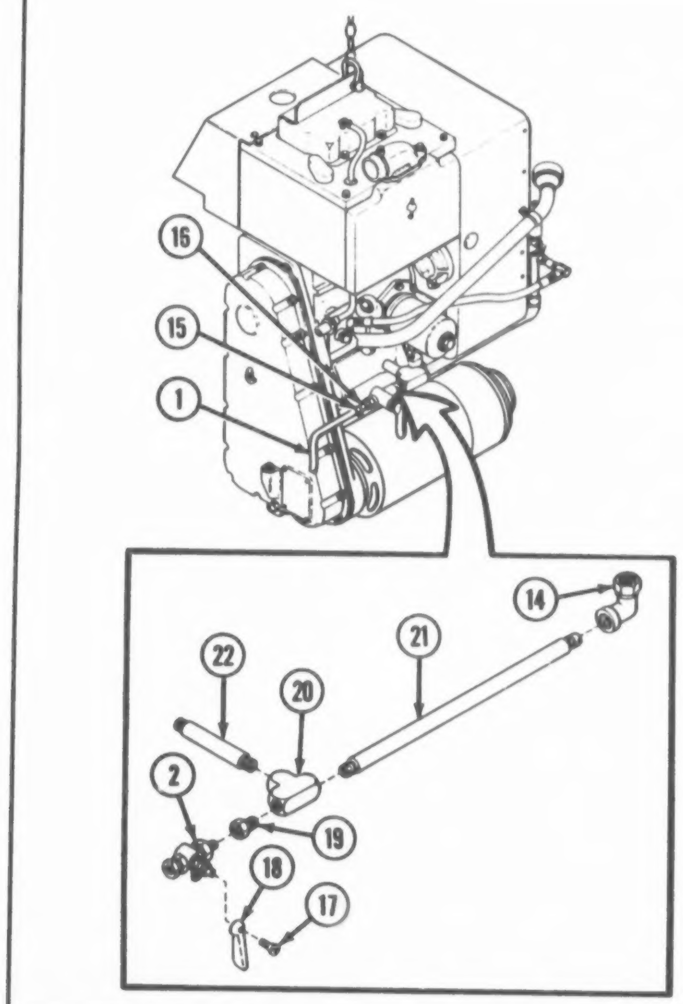
G Loosen fitting nut (8).

H Remove screw (9), lockwasher (10) and nut (11) securing clamp (12) to bracket (13).

I Remove tube assembly (7) from elbow (14).

TA309954

APU OIL DRAIN TUBING AND FITTINGS: REMOVAL AND INSTALLATION (CONTINUED)



J Loosen clamp (15) and pull hose (1) from tube (16). Remove tube (16) from valve assembly (2) by turning nut portion of tube.

K Remove screw (17) and handle (18).

L Remove valve (2) and bushing (19) from tee (20).

M Remove elbow (14) from pipe (21).

N Remove pipe (21) from tee (20).

O Remove tee (20) and nipple (22) from APU.

P Remove nipple (22) from tee (20).

INSTALLATION

Reverse removal procedures.

TA309955

APU OIL PRESSURE TRANSMITTER AND BREATHER HOSE: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

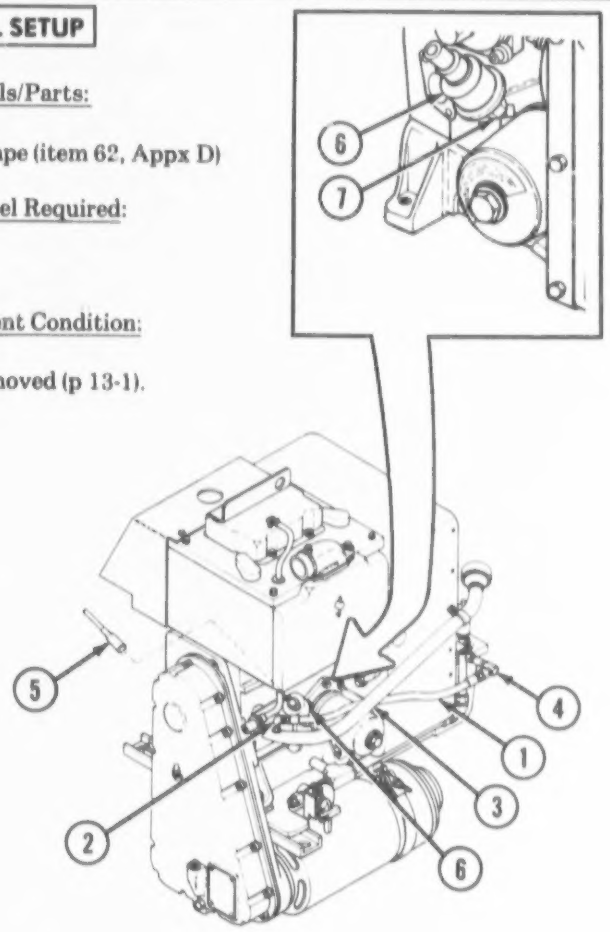
Teflon tape (item 62, Appx D)

Personnel Required:

Two

Equipment Condition:

APU removed (p 13-1).



REMOVAL

A Remove breather hose (1) from elbow (2) at base of oil filler tube assembly (3) and from saber gage tube assembly (4).

B Disconnect lead 420 (5) from oil pressure transmitter (6).

C Remove oil pressure transmitter (6) and adapter (7) from engine block.

D Remove adapter (7) from oil pressure transmitter (6).

INSTALLATION

NOTE

Use Teflon tape (item 62, Appx D) on all male pipe fittings prior to installation.

A Install adapter (7) on oil pressure transmitter (6).

B Install oil pressure transmitter (6) and adapter (7) on engine block.

C Connect lead 420 (5) to oil pressure transmitter (6).

D Install breather hose (1) to elbow (2) at base of oil filler tube assembly (3) and on saber gage tube assembly (4).

TA313063

APU OIL FILL TUBE: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

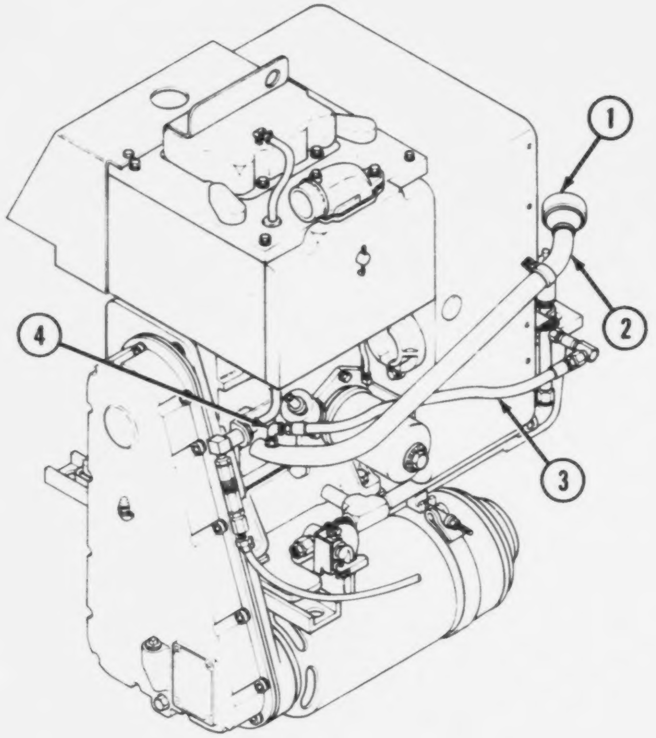
Adhesive sealant (item 5, Appx D)
Dry-cleaning solvent (item 20, Appx D)
Engine lubricating oil (item 38, Appx D)
Teflon tape (item 62, Appx D)

Personnel Required:

Two

Equipment Condition:

APU removed (p 13-1).



REMOVAL

A Remove cap (1) with gasket (hidden) from oil filler tube assembly (2).

B Check gasket for damage. If gasket is damaged, remove from cap (1) and discard.

C Remove breather hose (3) from elbow (4) at base of oil filler tube assembly (2).

D Remove elbow (4) from oil filler tube assembly (2).

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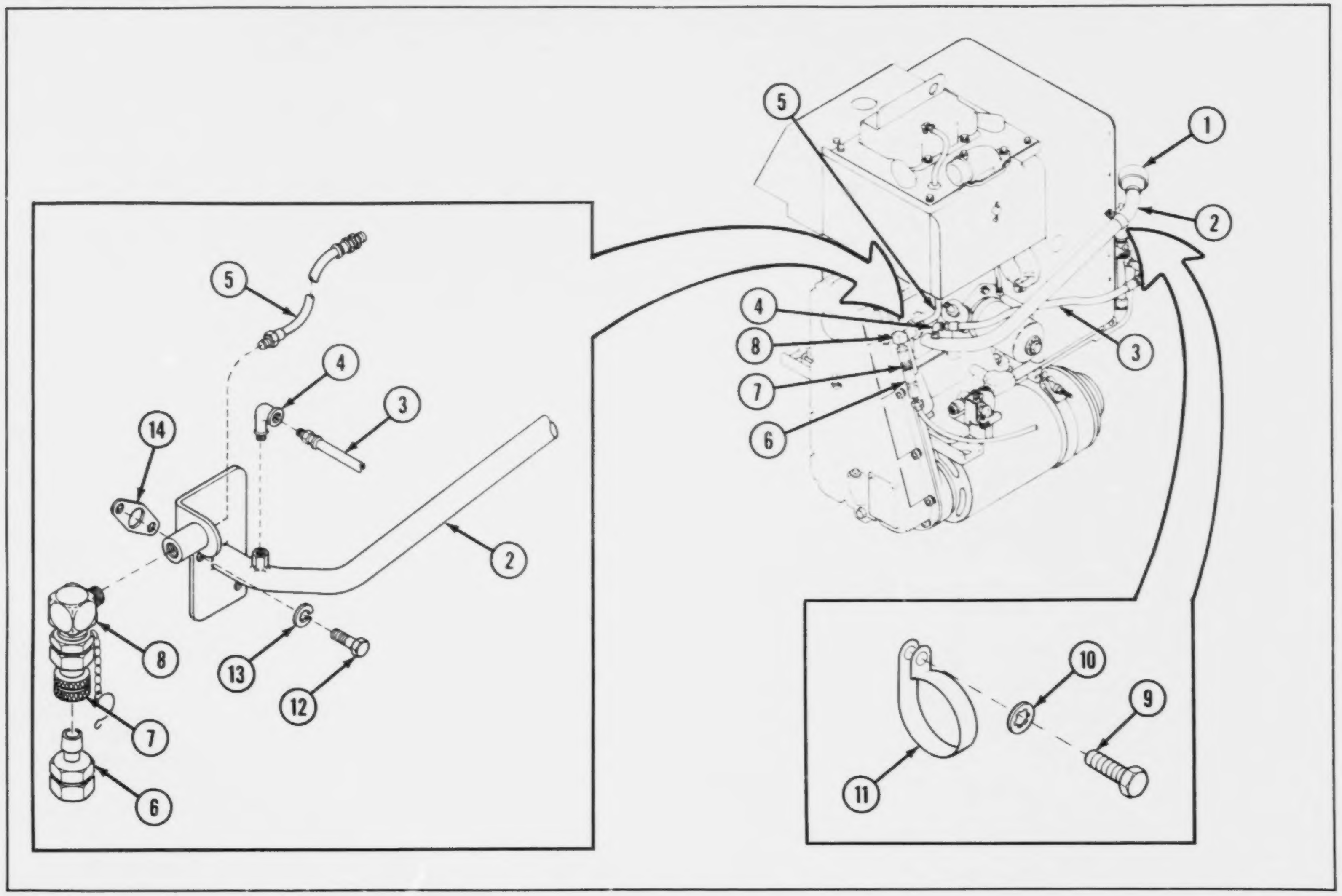
APU OIL FILL TUBE: REMOVAL AND INSTALLATION (CONTINUED)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APU OIL FILL TUBE: REMOVAL AND INSTALLATION (CONTINUED)

E Disconnect fuel return line (5) from bracket on oil filler tube assembly (2).

F Disconnect fuel return line quick-disconnect coupling (6) from coupling half (7) in elbow (8).

G Remove elbow (8) from bracket on oil filler tube assembly (2).

H Remove screw (9), lockwasher (10) and clamp (11) from oil filler tube assembly (2). Discard lockwasher.

I Remove two screws (12), two lockwashers (13) and oil filler tube assembly (2). Discard lockwashers. Screw two screws (12) back in housing.

INSTALLATION

A Secure clean rags in oil port opening where oil filler tube assembly (2) was removed.

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well-ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immedately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

B Scrape old gasket (14) from housing and clean housing mating surface with dry-cleaning solvent (item 20, Appx D).

C Remove rags from oil port opening. Remove two screws (12) from housing.

D Apply sealant adhesive (item 5, Appx D) to housing mating surface, to mating surface of oil filler tube assembly (2) and to both surfaces of new gasket (14).

E Position gasket (14) on housing mating surface and install oil filler tube assembly (2) on housing with two screws (12) and two new lockwashers (13).

F Install clamp (11) on oil filler tube assembly (2) with screw (9) and new lockwasher (10).

NOTE

Use Teflon tape (item 62, Appx D) on all male pipe fittings prior to installation.

G Install elbow (8) to bracket on oil filler tube assembly (2).

H Connect fuel return line quick-disconnect coupling (6) to coupling half (7) in elbow (8).

I Connect fuel return line (5) to bracket on oil filler tube assembly (2).

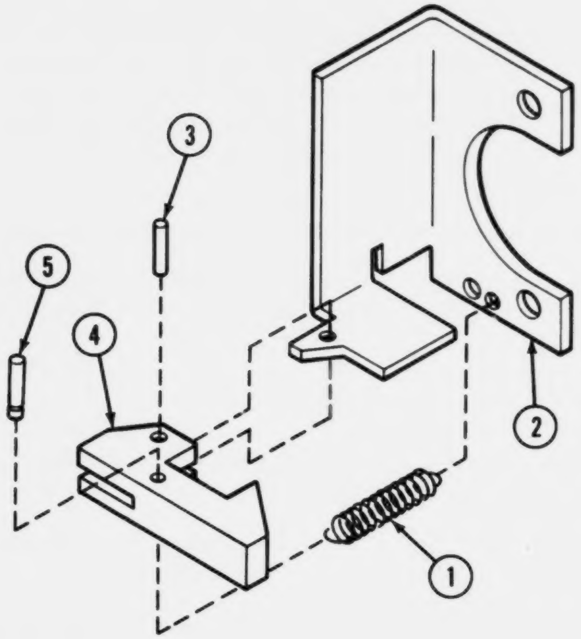
J Install elbow (4) on oil filler tube assembly (2). Connect breather hose (3) to elbow (4).

K If gasket (hidden) was removed from cap (1), install new gasket in cap (1).

L Install cap (1) on oil filler tube assembly (2).

TA313066

APU OIL DRAIN VALVE CATCH ASSEMBLY: DISASSEMBLY AND ASSEMBLY



DISASSEMBLY

A Remove spring (1) from bracket (2).

B Remove pin (3) and catch (4) from bracket (2).

C Remove pin (5) from catch (4).

ASSEMBLY

Reverse disassembly procedures.

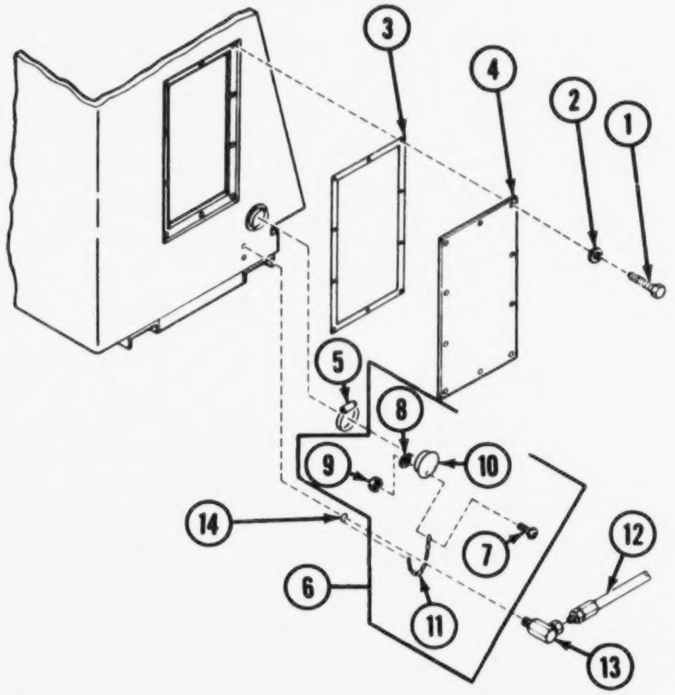
TA309958

APU COMPARTMENT ACCESS PLATE AND CAP ASSEMBLY: REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Left projectile rack moved to rear of vehicle (TM 9-2350-267-10).



REMOVAL

APU COMPARTMENT ACCESS PLATE

A Remove 10 screws (1), 10 lockwashers (2), gasket (3) and access plate (4). Discard lockwashers.

CAP ASSEMBLY

B Loosen hose clamp (5).

C Pull off cap assembly (6) from connector.

D Remove hose clamp (5).

E Remove screw (7), lockwasher (8), and nut (9) to release cap (10) from chain (11). Discard lockwasher.

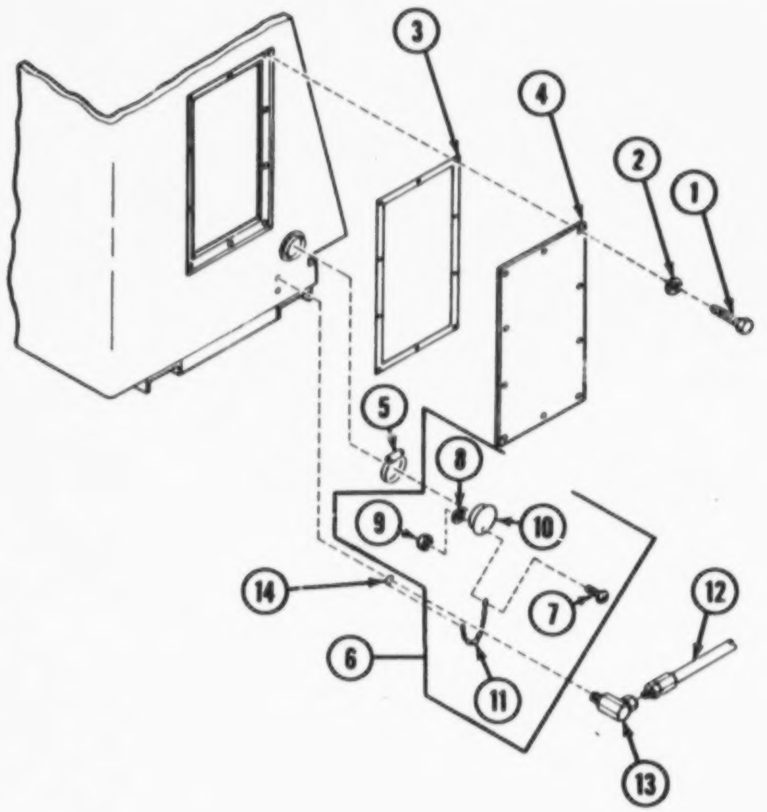
F Disconnect hydraulic line (12).

G Remove fitting (13) to release ring (14) and chain (11).

H Remove chain (11) from ring (14).

TA58079

APU COMPARTMENT ACCESS PLATE AND CAP ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

CAP ASSEMBLY

A Connect ring (14) to one end of chain (11).

B Mount ring (14) to wall using fitting (13).

C Connect hydraulic line (12).

D Secure cap (10) to free end of chain (11) using screw (7), new lockwasher (8), and nut (9).

E Position hose clamp (5) on cap (10).

F Press cap (10) onto connector.

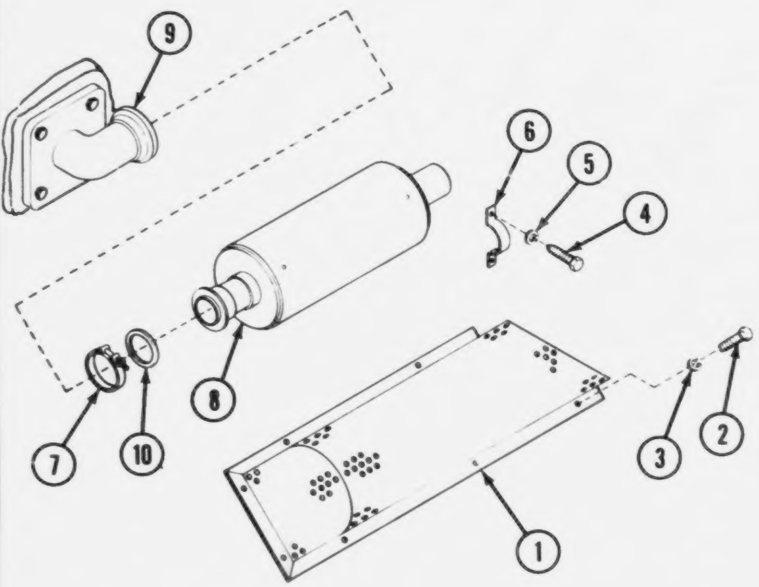
G Tighten hose clamp (5) on cap (10).

APU COMPARTMENT ACCESS PLATE

H Install access plate (4) and gasket (3) with 10 screws (1) and 10 new lockwashers (2).

TA58098

APU MUFFLER: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Do not touch muffler until it has cooled down.

A Remove muffler shield (1) by removing seven screws (2) and seven lockwashers (3). Discard lockwashers.

B Remove two screws (4), two lockwashers (5) and clamp (6). Discard lockwashers.

C Remove clamp (7) and pull muffler (8) from elbow (9). Remove and discard gasket (10).

INSTALLATION

NOTE

Install new gasket during installation.

Reverse removal procedures.

APU EXHAUST MUFFLER OUTLET ELBOWS: REMOVAL AND INSTALLATION

INITIAL SETUP

References:

TM 9-2350-267-10

REMOVAL

A Remove APU muffler (p 13-14).

B Open APU compartment side door (1).

C Remove clamp (2) and pull flexible pipe (3) from tube assembly (4).

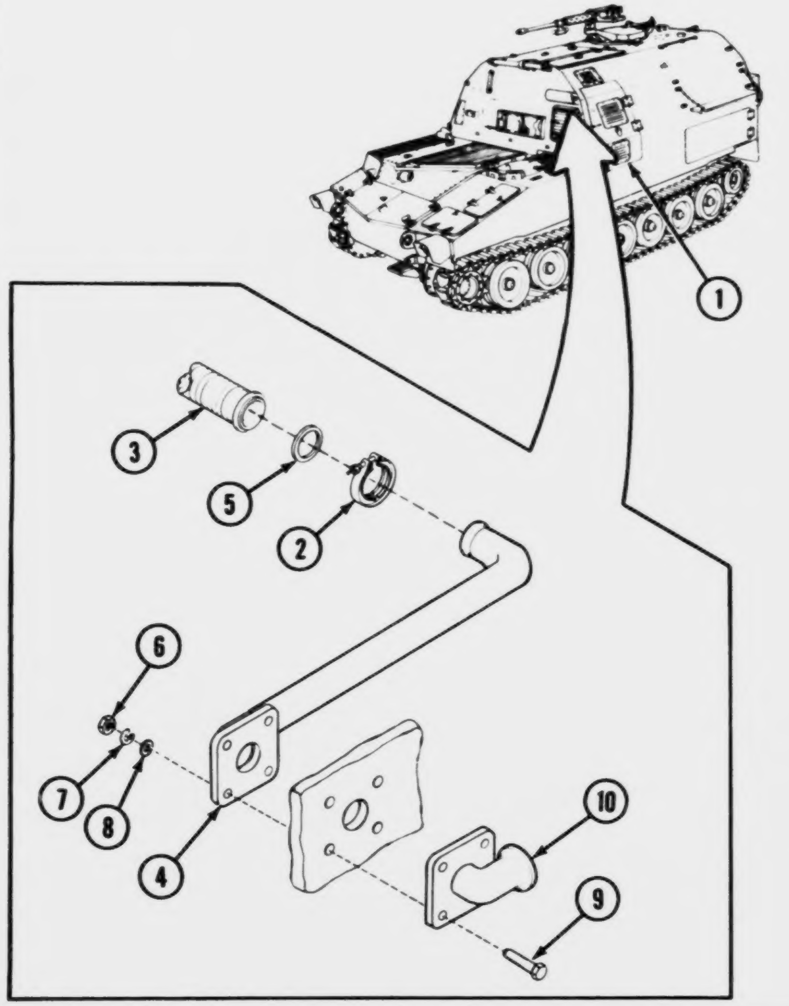
D Remove and discard shim (5).

E Remove four nuts (6), four lockwashers (7), four flat washers (8) and four screws (9). Discard lockwashers.

F Remove tube assembly (4) and outside elbow (10).

TA313067

APU EXHAUST MUFFLER OUTLET ELBOWS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Position outside elbow (10) on vehicle hull. Aline holes and insert four screws (9).

B Position tube assembly (4) on four screws (9) protruding through forward wall of APU compartment. Install four flat washers (8), four new lockwashers (7), and four nuts (6) on four screws (9). Tighten nuts (6).

C Position clamp (2) on flange of tube assembly (4).

D Install new shim (5) between tube assembly (4) and flexible pipe (3). Install flexible pipe (3) on tube assembly (4). Secure with clamp (2).

E Install APU muffler (p 13-14).

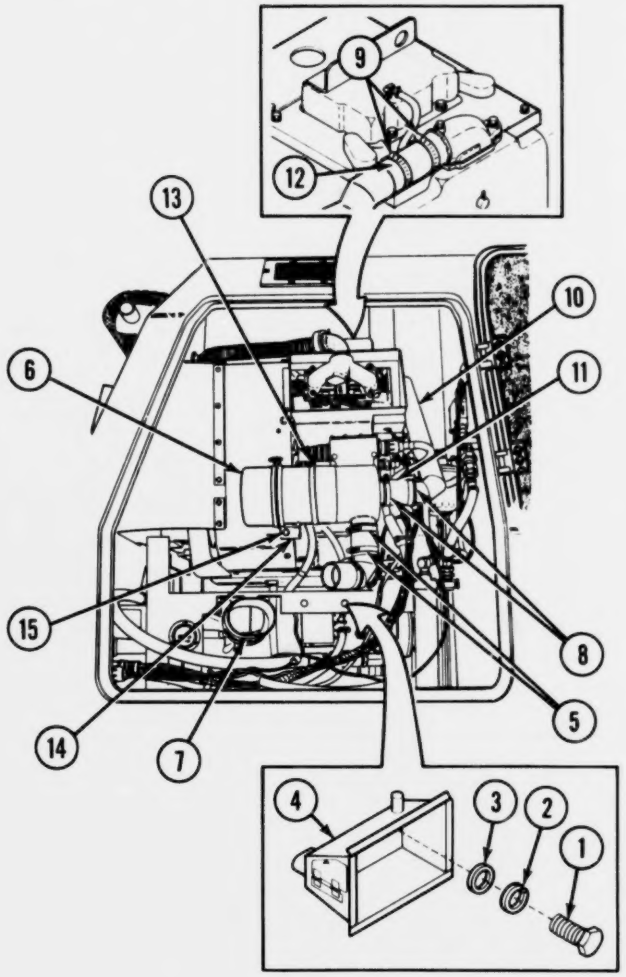
WARNING

APU is a source of carbon monoxide. Exhaust fittings and pipes must be installed and inspected carefully. Leaks could result in serious personal injury.

F Run APU (TM 9-2350-267-10) and inspect for exhaust leaks.

TA313068

APU AIR CLEANER, INLET AND OUTLET HOSES AND TUBES: REMOVAL AND INSTALLATION



REMOVAL

NOTE

Air cleaner assembly contains a replaceable, reusable filter element which may be removed by opening the housing (TM 9-2350-267-10).

A Remove two screws (1), two lockwashers (2) and two flat washers (3) from air-intake plenum (4).

B Remove two hose clamps (5) securing hose to air cleaner (6).

C Loosen plenum box generator hose clamp (7) and remove plenum (4) and attached air cleaner intake hose.

D Loosen four clamps (8 and 9) and remove tube (10), two hoses (11 and 12) and clamps (8 and 9).

E Loosen clamp (13) and remove air cleaner assembly (6) from bracket (14).

F Remove bracket (14) from APU by removing two screws (15).

INSTALLATION

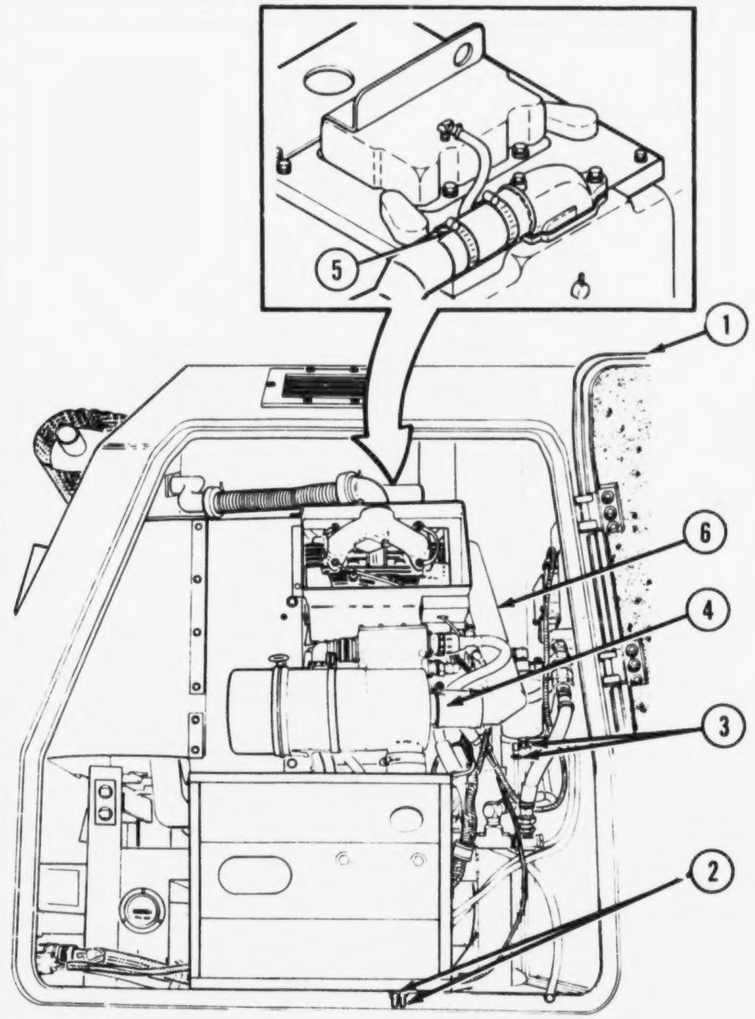
Reverse removal procedures.

NOTE

Apply sealing compound (item 53, Appx D) to screw threads.

TA309961

APU PRIMARY AND SECONDARY FUEL FILTERS: REMOVAL AND INSTALLATION



INITIAL SETUP

Test Equipment/Special Tools:

Brush, wire (item 48, Appx B)

Materials/Parts:

Dry-cleaning solvent (item 20, Appx D)
Teflon tape (item 62, Appx D)

References:

TM 9-2350-267-10

REMOVAL

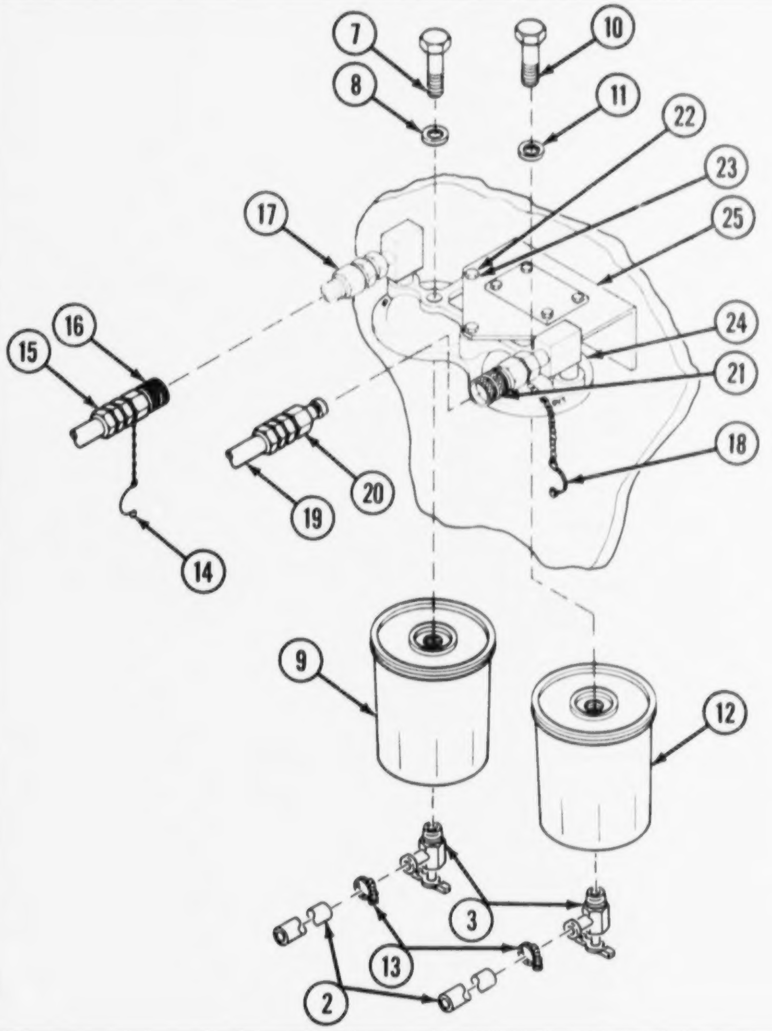
A Open APU compartment side door (1).

B Place ends of two fuel drain hoses (2) in suitable container. Open two drain cocks (3). When fuel flow stops, close drain cocks (3).

C Loosen two clamps (4 and 5). Remove air cleaner tube (6).

TA313069

APU PRIMARY AND SECONDARY FUEL FILTERS: REMOVAL AND INSTALLATION (CONTINUED)



D Remove screw (7) and washer (8) releasing primary filter (9).

E Remove screw (10) and washer (11) releasing secondary filter (12).

F Loosen two clamps (13) releasing hoses (2) from drain cocks (3).

G Unscrew drain cocks (3) from filters (9 and 12).

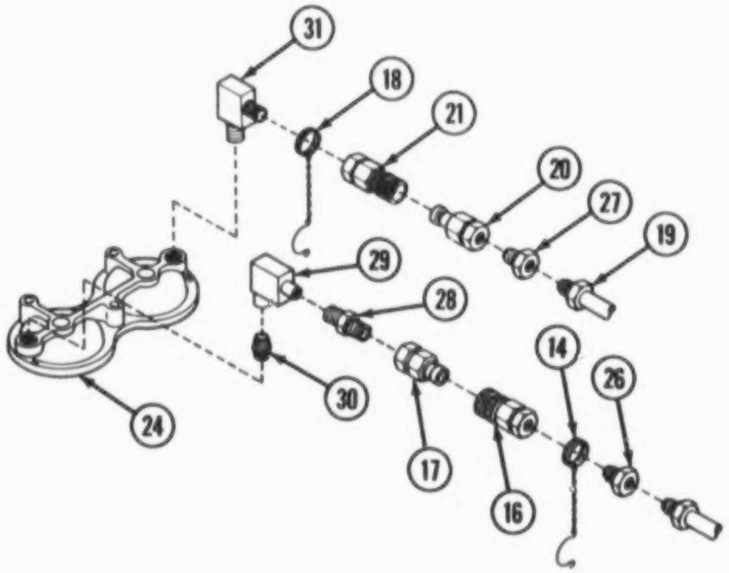
H Pull retainer clip (14). Disconnect primary filter input line (15) at quick-disconnect coupling halves (16 and 17).

I Pull retainer clip (18). Disconnect secondary filter output line (19) at quick-disconnect coupling halves (20 and 21).

J Remove three screws (22) and three lockwashers (23) releasing filter head (24) and attached parts from mounting bracket (25). Discard lockwashers.

TA313070

APU PRIMARY AND SECONDARY FUEL FILTERS: REMOVAL AND INSTALLATION (CONTINUED)



K Remove coupling half (16) from connector (26), releasing retainer clip (14).

L Remove coupling half (20) from connector (27).

M Remove connector (27) from secondary filter output line (19).

N Remove coupling half (17) from nipple (28).

O Remove nipple (28) from elbow (29).

P Remove elbow (29) from nipple (30).

Q Remove coupling half (21) from elbow (31), releasing retaining clip (18).

R Remove elbow (31) from filter head (24).

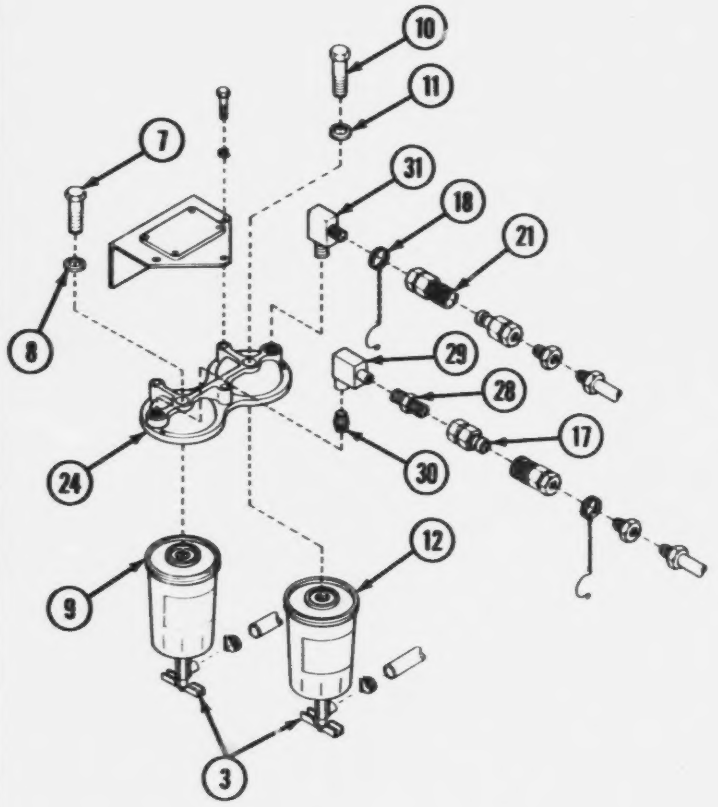
WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

S Clean all threads using dry-cleaning solvent (item 20, Appx D) and suitable wire brush (item 48, Appx B).

TA313071

APU PRIMARY AND SECONDARY FUEL FILTERS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTE

Apply Teflon tape (item 62, Appx D) to all male threads of items being installed.

A Install elbow (31) in filter head (24).

B Position ring of retainer clip (18) and install coupling half (21) on elbow (31).

C Install nipple (30) in filter head (24).

D Install elbow (29) and nipple (28).

E Secure coupling half (17) on nipple (28).

F Moisten washers (8 and 11) and seals at top of filters (9 and 12) with diesel fuel.

NOTE

Make sure filter seating areas of filter head are clean.

G Install primary filter (9) against IN side of filter head (24) with washer (8) and screw (7). Finger-tighten screw (7).

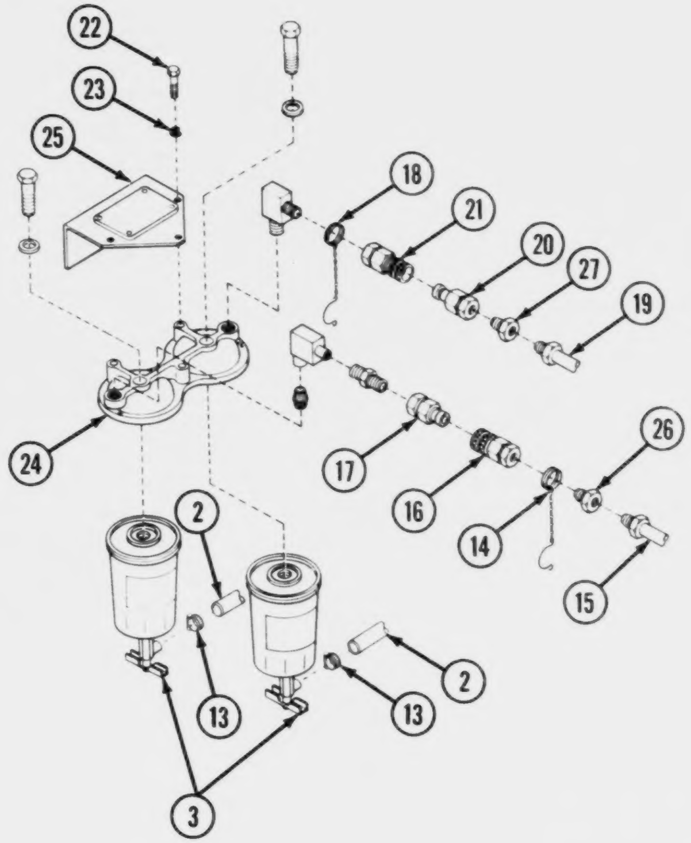
H Install secondary filter (12) against OUT side of filter head (24) with washer (11) and screw (10). Finger-tighten screw (10).

I Tighten screws (7 and 10) one and one-half additional turns to compress seals at top of filters (9 and 12).

J Install and close two drain cocks (3).

TA313072

APU PRIMARY AND SECONDARY FUEL FILTERS: REMOVAL AND INSTALLATION (CONTINUED)



K Install connector (27) on secondary fuel line (19).

L Install coupling half (20) on connector (27).

M Position ring of retainer clip (14) on coupling half (16), then install coupling half (16) on connector (26).

N Install fuel drain hoses (2) on drain cocks (3) with two clamps (13).

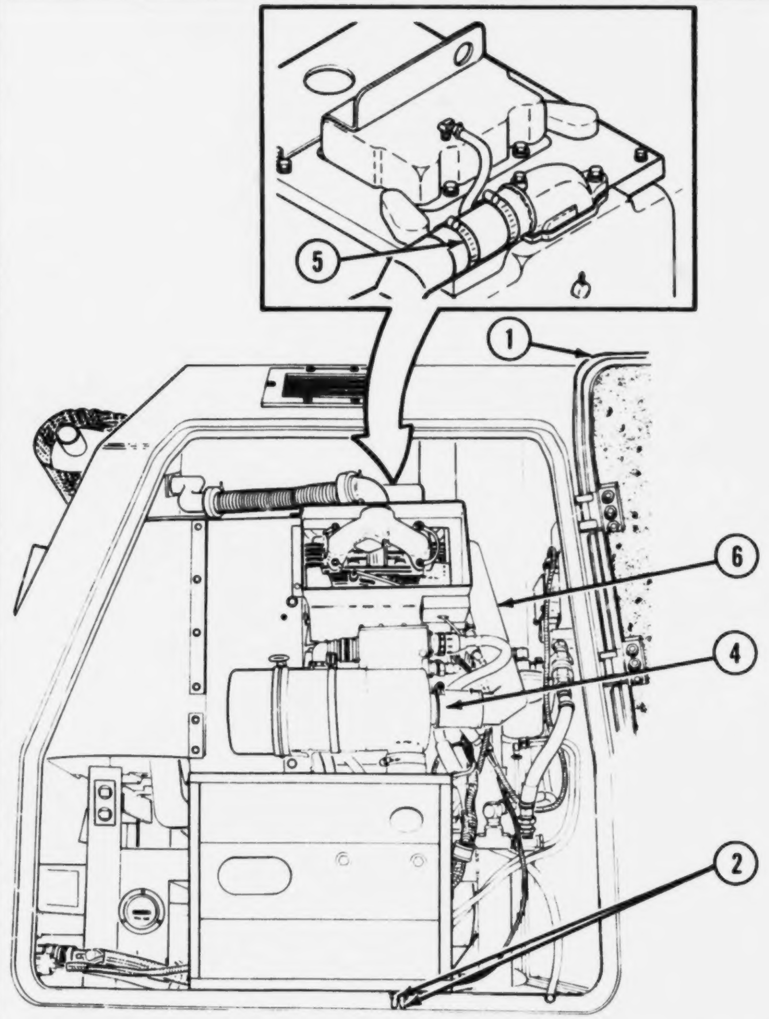
O Install filter head (24) and attached parts under bracket (25) with three new lockwashers (23) and three screws (22).

P Connect secondary filter output line (19) by connecting coupling halves (20 and 21). Insert clip of retainer clip (18) behind knurled release sleeve of coupling half (21).

Q Connect primary filter input line (15) by connecting coupling halves (16 and 17). Insert clip of retainer clip (14) behind knurled release sleeve of coupling half (16).

TA313073

APU PRIMARY AND SECONDARY FUEL FILTERS: REMOVAL AND INSTALLATION (CONTINUED)



R Install air cleaner tube (6) and clamps (4 and 5).

S Place two fuel drain hoses (2) in slot at bottom flange of APU door.

T Operate APU (TM 9-2350-267-10). Check for leakage.

U Close APU compartment side door (1).

TA313074

APU HYDRAULIC PRESSURE SWITCH ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

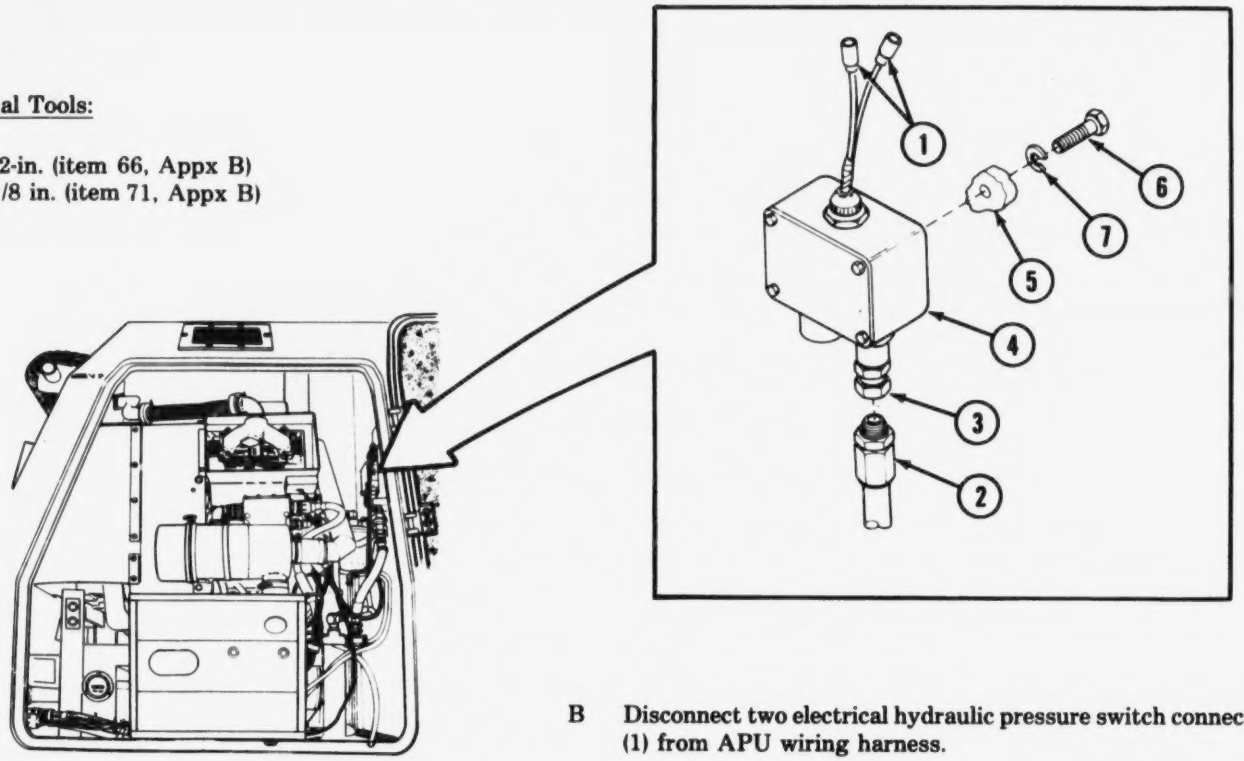
Wrench, adjustable, 12-in. (item 66, Appx B)
Wrench, open end, 1-1/8 in. (item 71, Appx B)

References:

TM 9-2350-267-10

Personnel Required:

Two



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground cables.

A Open APU compartment side door.

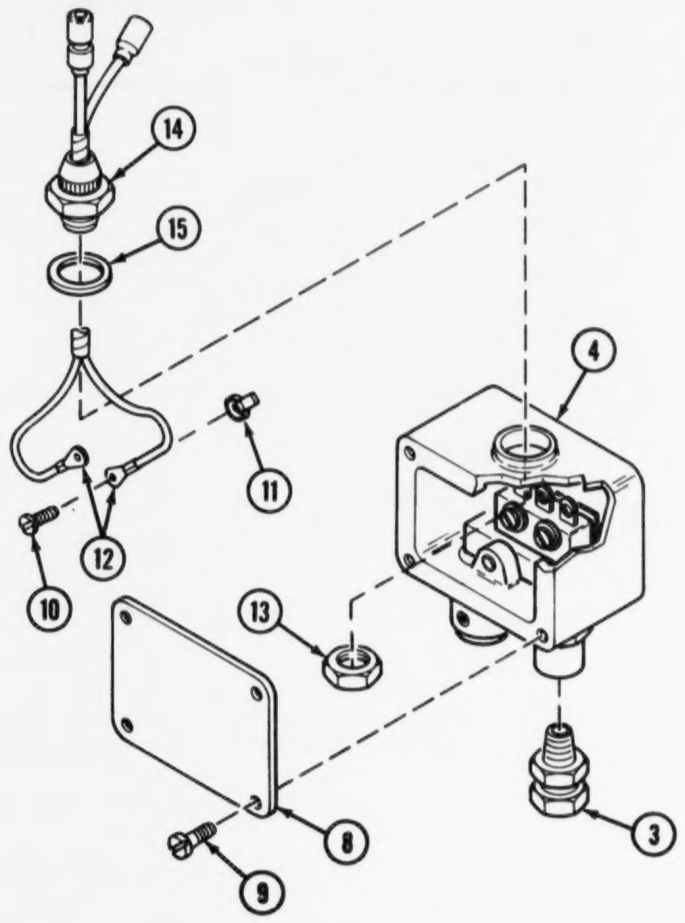
B Disconnect two electrical hydraulic pressure switch connectors (1) from APU wiring harness.

C Disconnect APU pressure hose (2) at connector (3).

D Remove hydraulic pressure switch assembly (4) from APU compartment wall (5) by removing four screws (6) and four lockwashers (7) located on outside of APU compartment wall. Discard lockwashers.

TA313075

APU HYDRAULIC PRESSURE SWITCH ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove cover (8) from pressure switch (4) by removing four screws (9).

B Remove two screws (10) and two washers (11) securing two leads (12) to pressure switch (4).

C Unscrew nut (13) from adapter (14).

D Remove adapter (14) with two leads (12) attached and gasket (15) from pressure switch (4). Discard gasket.

E Remove connector (3) from pressure switch (4).

ASSEMBLY

A Install connector (3) on pressure switch (4).

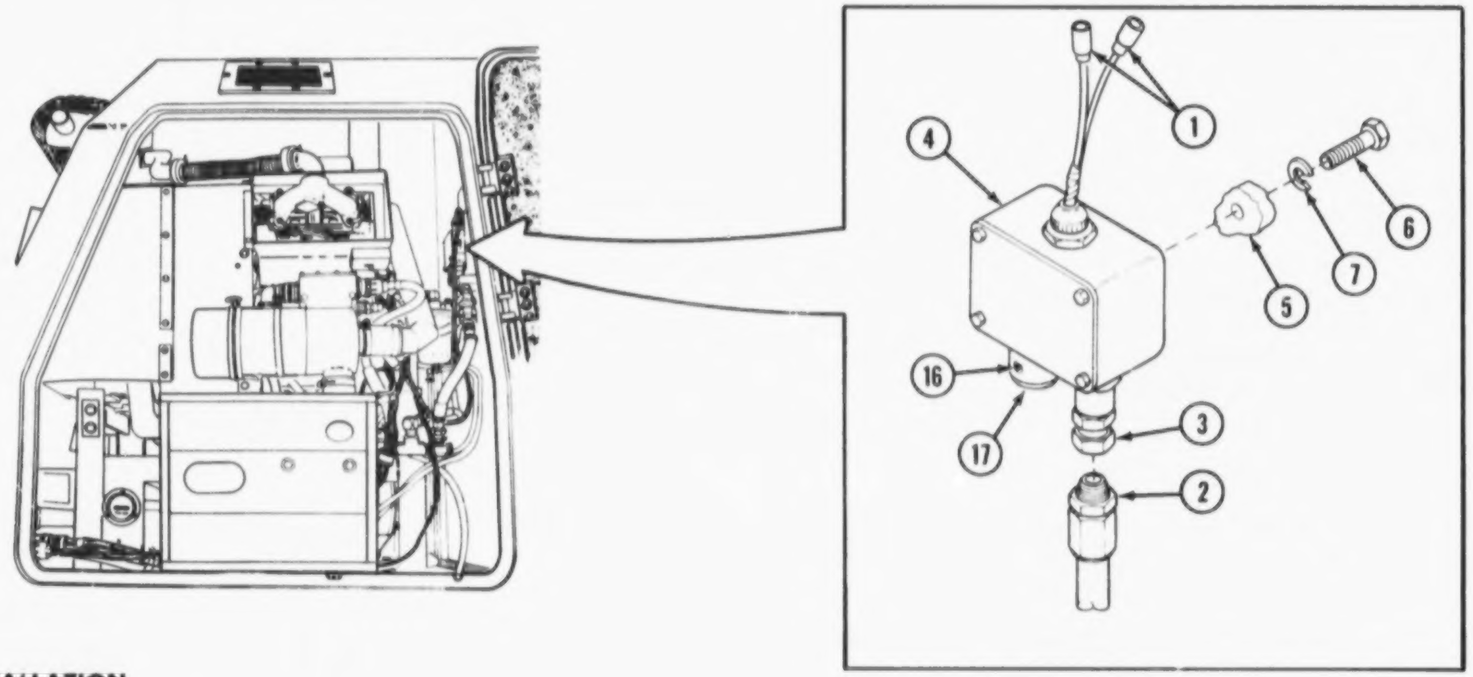
B Install adapter (14) with two leads (12) attached and new gasket (15) on pressure switch (4) with nut (13).

C Attach two leads (12) to pressure switch (4) with two screws (10) and two washers (11).

D Install cover (8) on pressure switch (4) with four screws (9).

TA313076 ■

APU HYDRAULIC PRESSURE SWITCH ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



INSTALLATION

A Install hydraulic pressure switch assembly (4) on APU compartment wall (5) with four new lockwashers (7) and four screws (6).

B Connect APU pressure hose (2) to connector (3).

C Connect two electrical hydraulic pressure switch connectors (1) to APU wiring harness.

D Connect battery ground cables.

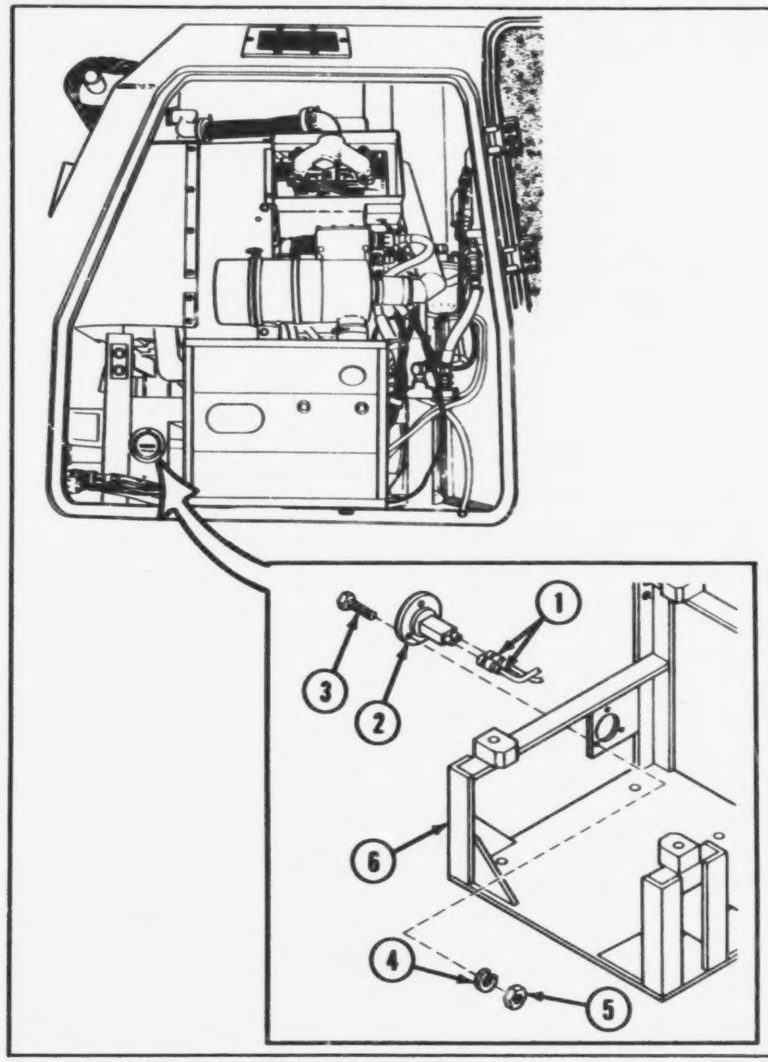
E Turn on APU fuel switch and MASTER switch and run APU (TM 9-2350-267-10). Check for proper operation of pressure switch (4). If adjustment is necessary, loosen setscrew (16) and turn screw (17).

F Check for oil leaks at pressure switch (4) and pressure hose (2). Shut down APU.

G Close APU compartment side door.

TA313077

APU HOURMETER: REMOVAL AND INSTALLATION



REMOVAL

A Open APU compartment side door.

B Disconnect two electrical wires (1) from back side of hourmeter (2).

C Remove three screws (3), three lockwashers (4) and three nuts (5) securing hourmeter (2) to APU support (6). Discard lockwashers.

INSTALLATION

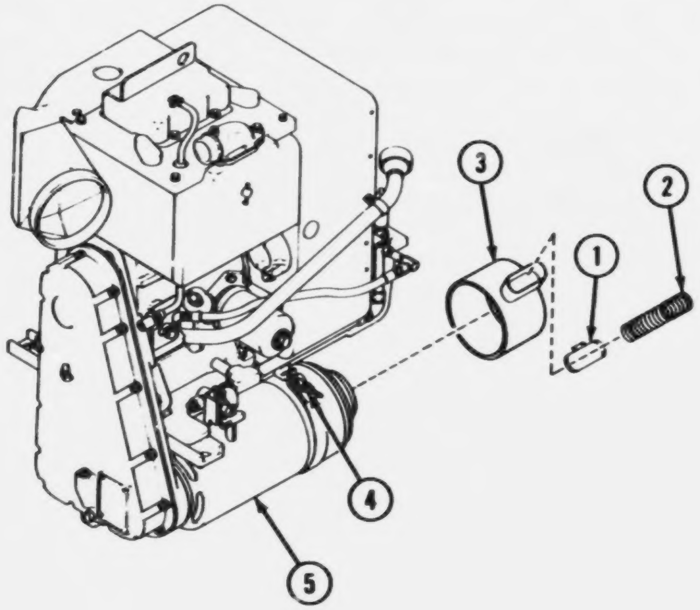
A Install hourmeter (2) on APU support (6) with three nuts (5), three new lockwashers (4) and three screws (3).

B Connect two electrical wires (1) to back side of hourmeter (2).

C Close APU compartment side door.

TA313078

APU GENERATOR AIR DUCT AND ATTACHING HARDWARE: REMOVAL AND INSTALLATION



REMOVAL

A Remove plenum (p 13-1).

B Remove APU compartment access plate (p 13-13).

C Loosen clamp (1).

D Pull hose (2) free of air duct (3).

E Release strap (4) to allow air duct (3) to slide off generator (5).

F Remove air duct (3).

INSTALLATION

Reverse removal procedures.

TA309964

APU GENERATOR: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

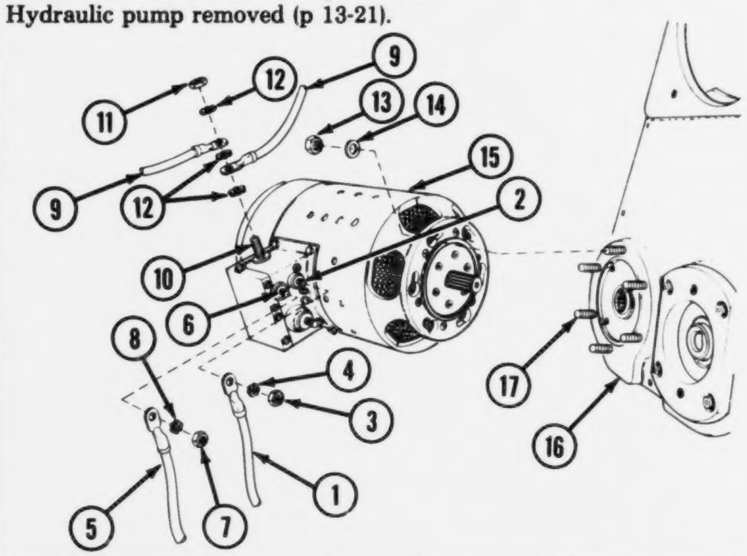
Adhesive sealant (item 5, Appx D)
Dry-cleaning solvent (item 20, Appx D)

Personnel Required:

Two

Equipment Condition:

APU removed (p 13-1).
Support stand and support assembly removed (p 13-5).
Generator air duct removed (p 13-18.3).
Hydraulic pump removed (p 13-21).



REMOVAL

WARNING

Turn MASTER switch OFF. Disconnect battery ground cables.

A Remove electrical lead 78A (1) from terminal D (2) by removing nut (3) and washer (4). Discard lockwasher.

B Remove electrical lead 61 (5) from terminal A (6) by removing nut (7) and lockwasher (8). Discard lockwasher.

C Remove two electrical ground leads (9) from terminal E (10) by removing nut (11) and three lockwashers (12). Discard lockwashers.

NOTE

One person should support generator when mounting nuts are loosened.

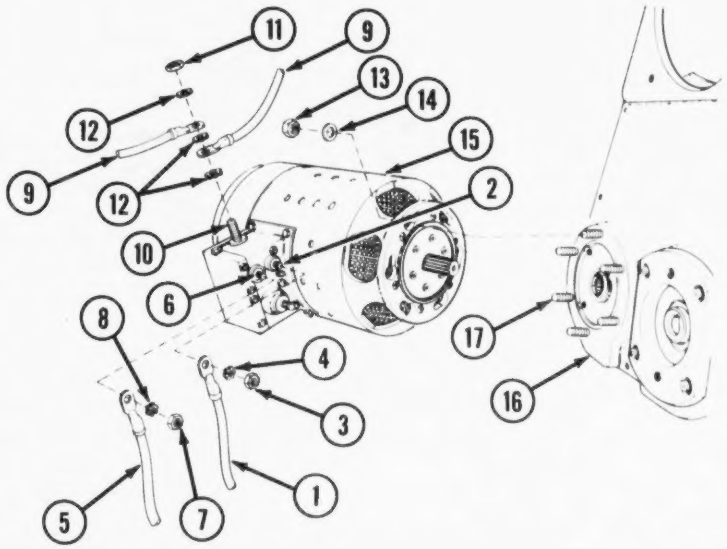
D Remove six self-locking nuts (13) and six washers (14). Discard self-locking nuts.

E With an assistant, remove generator (15) by turning counterclockwise then pulling from APU chaincase (16).

F Replace any damaged studs (17) (p 13-20.1).

TA313079

APU GENERATOR: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A With an assistant, position generator (15) on chain housing mounting studs (17) so terminal box is at 2 o'clock.

B Make sure all washers (14) are inside generator endbell, then turn generator clockwise to lock in place.

C Install six new self-locking nuts (13).

WARNING

Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

D Remove any traces of old sealant from terminals (2, 6 and 10) with dry-cleaning solvent (item 20, Appx D).

E Install two electrical ground leads (9) on terminal E (10) with three new lockwashers (12), and nut (11).

F Install electrical lead 61 (5) on terminal A (6) with new lockwasher (8) and nut (7).

G Install electrical lead 78A (1) on terminal D (2) with new lockwasher (4) and nut (3).

H Seal terminals (2, 6 and 10) and connected leads with adhesive sealant (item 5, Appx D).

APU GENERATOR MOUNTING STUD: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

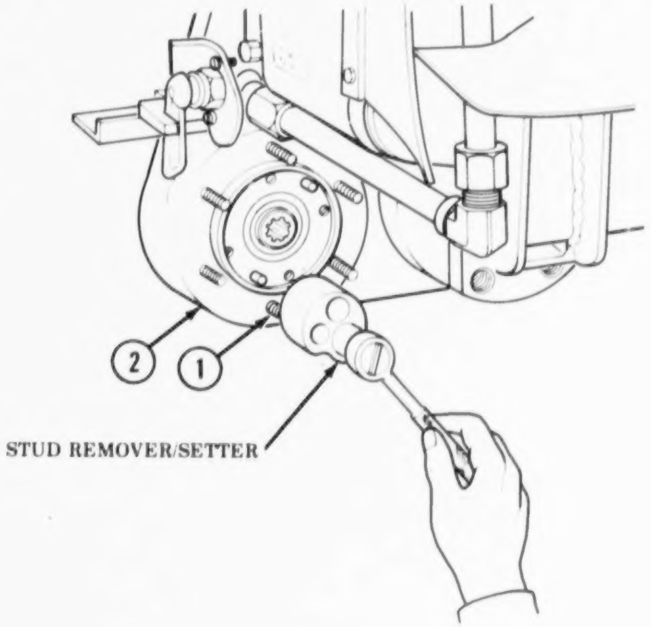
Drill, portable electric (item 50, Appx B)
Deepwell socket (item 49, Appx B)
Screw extractor (item 57, Appx B)
Stud remover/setter (item 63, Appx B)
Twist drill, 1/4-in. (item 64, Appx B)

Materials/Parts:

Teflon tape (item 61, Appx D)

Equipment Condition:

APU generator removed (p 13-19).



REMOVAL

NOTE

If stud to be removed is bent, broken, or stripped, do step A only. If stud to be removed is broken off flush with case, do steps B and C.

A Using a stud remover and setter, remove stud (1) from gearcase (2).

TA313081

APU GENERATOR MOUNTING STUD: REMOVAL AND INSTALLATION (CONTINUED)

CAUTION

Do not drill into stud more than 3/4-inch deep. Wrap tape around drill bit 3/4 inch from tip of bit to insure proper depth. Damage to gearcase will result if drill bit is allowed to penetrate stud more than 3/4 inch.

NOTE

Use center punch and hammer to mark center of stud to assure centering of drill bit.

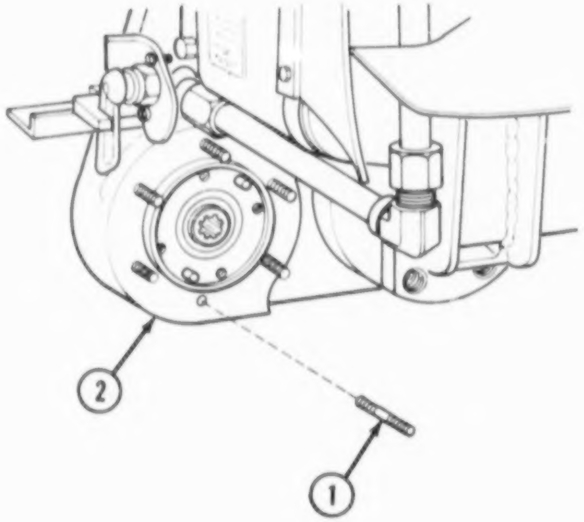
B Drill pilot hole 3/4-inch deep in center of stud (1).

C Tap screw extractor into pilot hole of stud (1). Remove and discard stud.

INSTALLATION

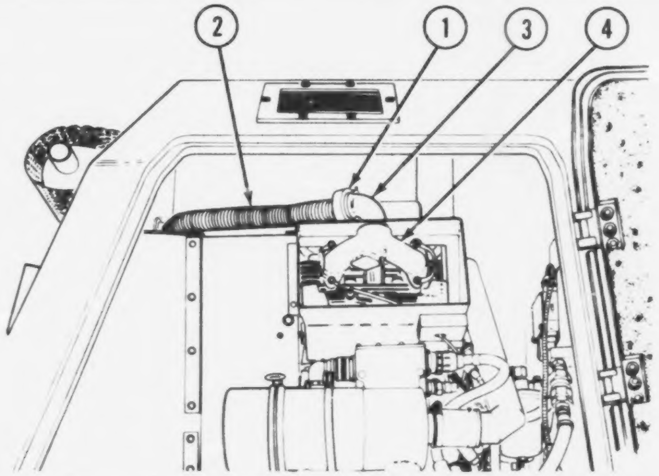
A Wrap Teflon tape (item 61, Appx D) around end of new stud (1) is to be inserted in gearcase (2).

B Install stud (1) in gearcase (2) using a stud remover and setter.



TA313082

APU EXHAUST MANIFOLD ELBOW: REMOVAL AND INSTALLATION



REMOVAL

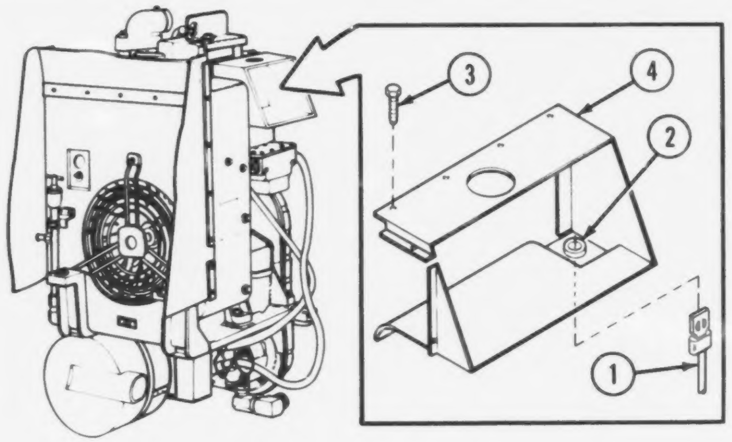
A Remove clamp (1) and pull flexible hose (2) from elbow (3).

B Unscrew and remove elbow (3) from exhaust manifold (4).

INSTALLATION

Reverse removal procedures.

APU COOLING AIR DUCT: REMOVAL AND INSTALLATION



REMOVAL

A Remove APU exhaust manifold elbow (p 13-20.3).

B Disconnect ground lead wire 493 (1) from high-temperature switch and pull through grommet (2).

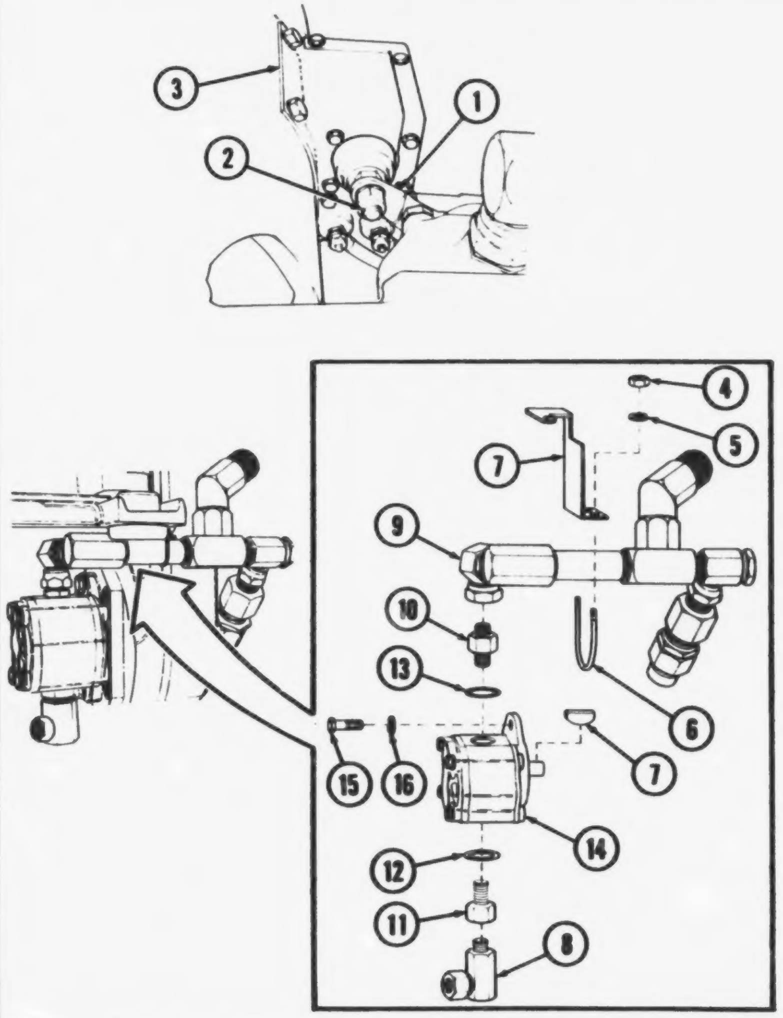
C Remove six screws (3) from air duct (4), and remove air duct (4) from APU.

INSTALLATION

Reverse removal procedures.

TA313083

APU HYDRAULIC PUMP: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove APU with support stand from APU compartment (p 13-1).

B Disconnect one electrical cable terminal 66 (1) from terminal B (2) of generator (3).

C Remove two nuts (4) and two lockwashers (5) securing U-bolt (6) to bracket (7).

D Remove elbows (8 and 9) from adapters (10 and 11).

E Remove adapters (10 and 11) and packings (12 and 13) from pump (14). Discard packings.

F Remove pump (14) by removing two screws (15) and two lockwashers (16).

G Remove woodruff key (17) from shaft of pump (14).

INSTALLATION

NOTE

Install new packings in step E.

Reverse order of removal procedures.

TA309967

APU HYDRAULIC PUMP INLET AND OUTLET FITTINGS AND U-BOLT ASSEMBLY: REMOVAL AND INSTALLATION

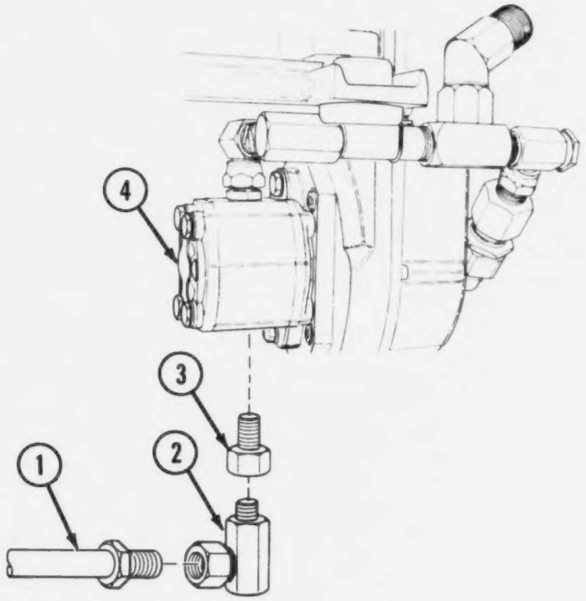
INITIAL SETUP

Materials/Parts:

Teflon tape (item 62, Appx D)

Equipment Condition:

Air-intake plenum removed (p 13-1).
Hydraulic reservoir ball valve closed (p 16-2).



REMOVAL

WARNING

Make sure all hydraulic systems are shut down, and MASTER switch is OFF.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

NOTES

Tag hoses and fittings for identification at installation.

Provide a suitable container under hydraulic pump and hoses for oil spills.

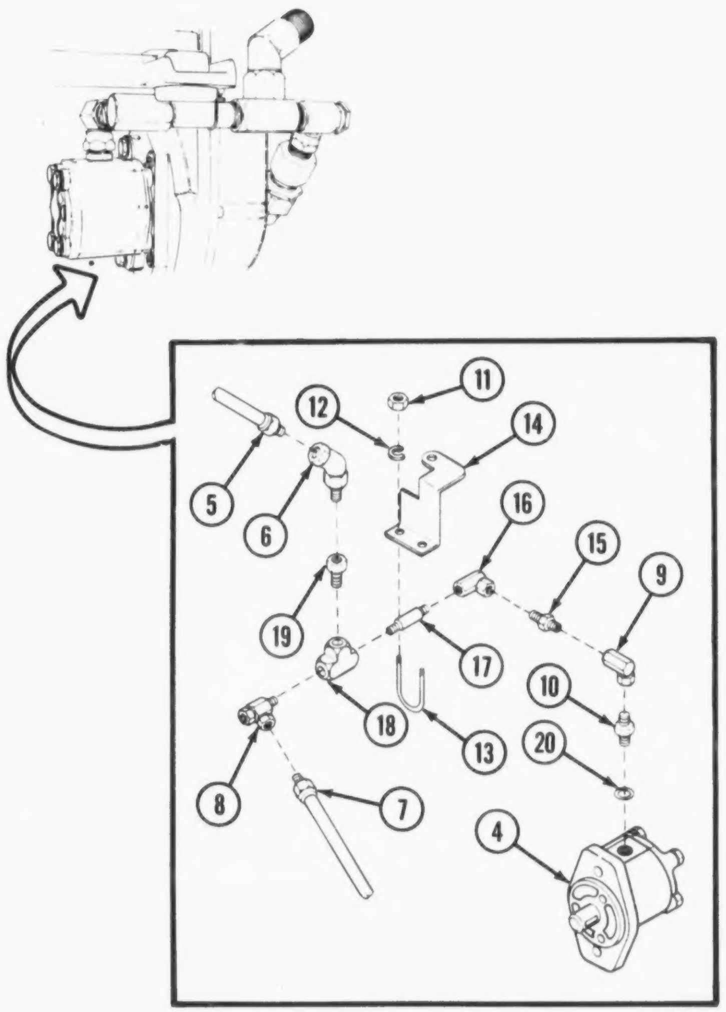
A Disconnect hydraulic pump inlet hose (1) from elbow (2).

B Remove elbow (2) from adapter (3).

C Remove adapter (3) from port 63 at bottom of pump (4).

TA313084

APU HYDRAULIC PUMP INLET AND OUTLET FITTINGS AND U-BOLT ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



D Disconnect hydraulic pressure switch hose (5) from elbow (6).

E Disconnect outlet hose (7) from valve (8).

F Disconnect elbow (9) from adapter (10).

G Remove two nuts (11) and two lockwashers (12) which secure U-bolt (13) to bracket (14). Discard lockwashers.

H Remove elbow (9), nipple (15), elbow (16), nipple (17), tee (18), valve (8), adapter (19), and elbow (6) as an assembly from the APU.

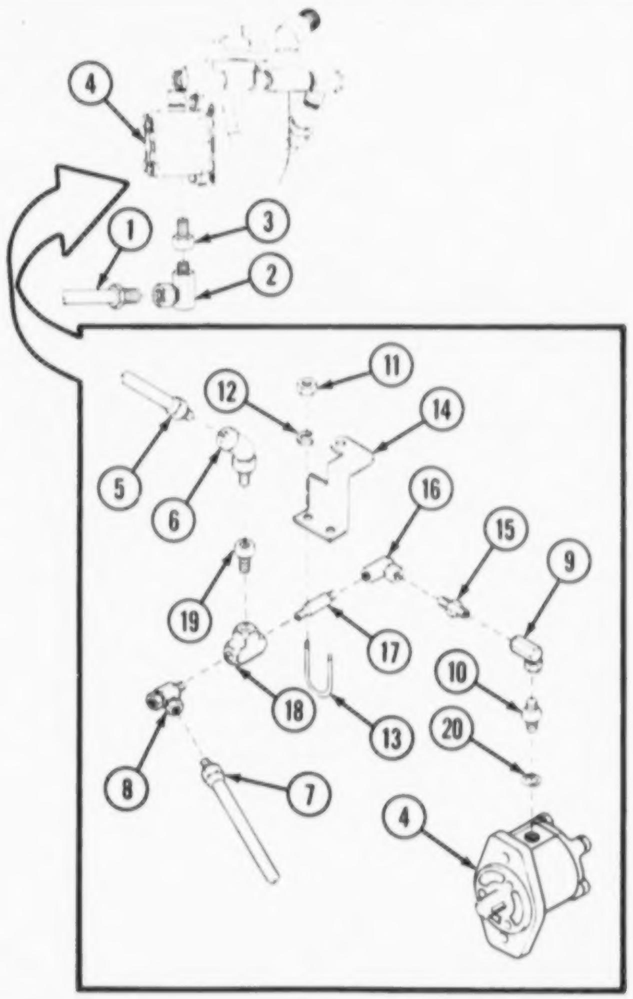
I Remove adapter (10) from port 64 at top of pump (4).

J Remove and discard packing (20).

K Separate elbow (9), nipple (15), elbow (16), nipple (17), tee (18), valve (8), adapter (19), and elbow (6) as necessary.

TA313085

APU HYDRAULIC PUMP INLET AND OUTLET FITTINGS AND U-BOLT ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

NOTE

Apply Teflon tape (item 62, Appx D) to all male pipe fittings prior to installation.

A Connect elbow (6), adapter (19), valve (8), tee (18), nipple (17), elbow (16), nipple (15) and elbow (9) as necessary.

B Install new packing (20).

C Install adapter (10) in port 64 at top of pump (4).

D Position assembled fittings on bracket (14) and secure with U-bolt (13), two new lockwashers (12), and two nuts (11).

E Connect elbow (9) to adapter (10).

F Connect outlet hose (7) to valve (8).

G Connect hydraulic pressure switch hose (5) to elbow (6).

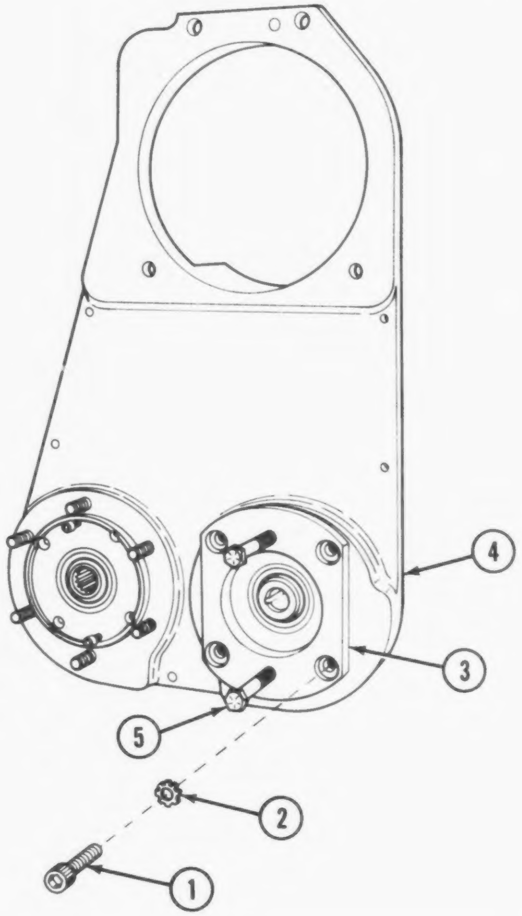
H Install adapter (3) in port 63 at bottom of pump (4).

I Connect elbow (2) to adapter (3).

J Connect hydraulic pump inlet hose (1) to elbow (2).

TA313086

APU HYDRAULIC PUMP ADAPTER PLATE: REMOVAL AND INSTALLATION



REMOVAL

A Remove hydraulic pump (p 13-21).

B Remove four screws (1) and four lockwashers (2) from adapter plate (3) and gear case (4).

C Install two 3/8-16NC-2B puller screws (5) in adapter plate (3) puller holes.

D Using puller screws (5), remove adapter plate (3) from gear case (4).

E Remove puller screws (5) from adapter plate (3).

INSTALLATION

A Position and secure adapter plate (3) on gear case (4) with four screws (1) and four lockwashers (2).

B Install hydraulic pump (p 13-21).

TA309970

APU INLET FUEL LINE (BULKHEAD TO PRIMARY FILTER): REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

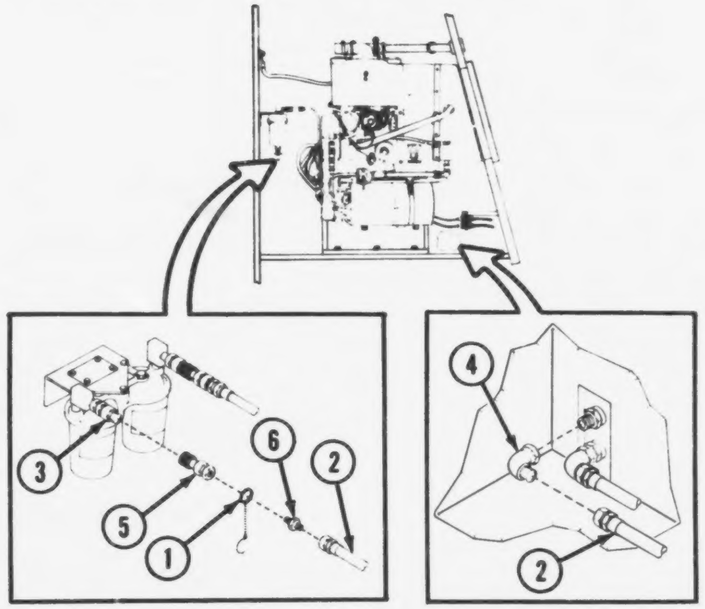
Teflon tape (item 62, Appx D)

References:

TM 9-2350-267-10

Equipment Condition:

APU compartment access plate removed (p 13-13).



REMOVAL

A Pull retainer clip (1) and disconnect inlet fuel hose (2) at primary filter quick-disconnect coupling half (3).

B Disconnect inlet fuel hose (2) from bulkhead elbow (4) and remove inlet hose (2) from vehicle.

C Remove quick-disconnect coupling half (5) and adapter (6) from hose (2) and remove retainer clip (1).

D Remove elbow (4) from bulkhead.

INSTALLATION

NOTE

Use Teflon tape (item 62, Appx D) on all male pipe fittings prior to installation.

A Install elbow (4) in bulkhead.

B Install retainer clip (1), adapter (6) and quick-disconnect coupling half (5) on fuel inlet hose (2).

C Connect fuel inlet hose (2) to bulkhead mounted elbow (4).

D Connect quick-disconnect coupling half (5) to primary filter quick-disconnect coupling half (3).

E Run APU (TM 9-2350-267-10). Check for fuel leaks.

TA313087

APU FUEL RETURN LINE (APU TO BULKHEAD): REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

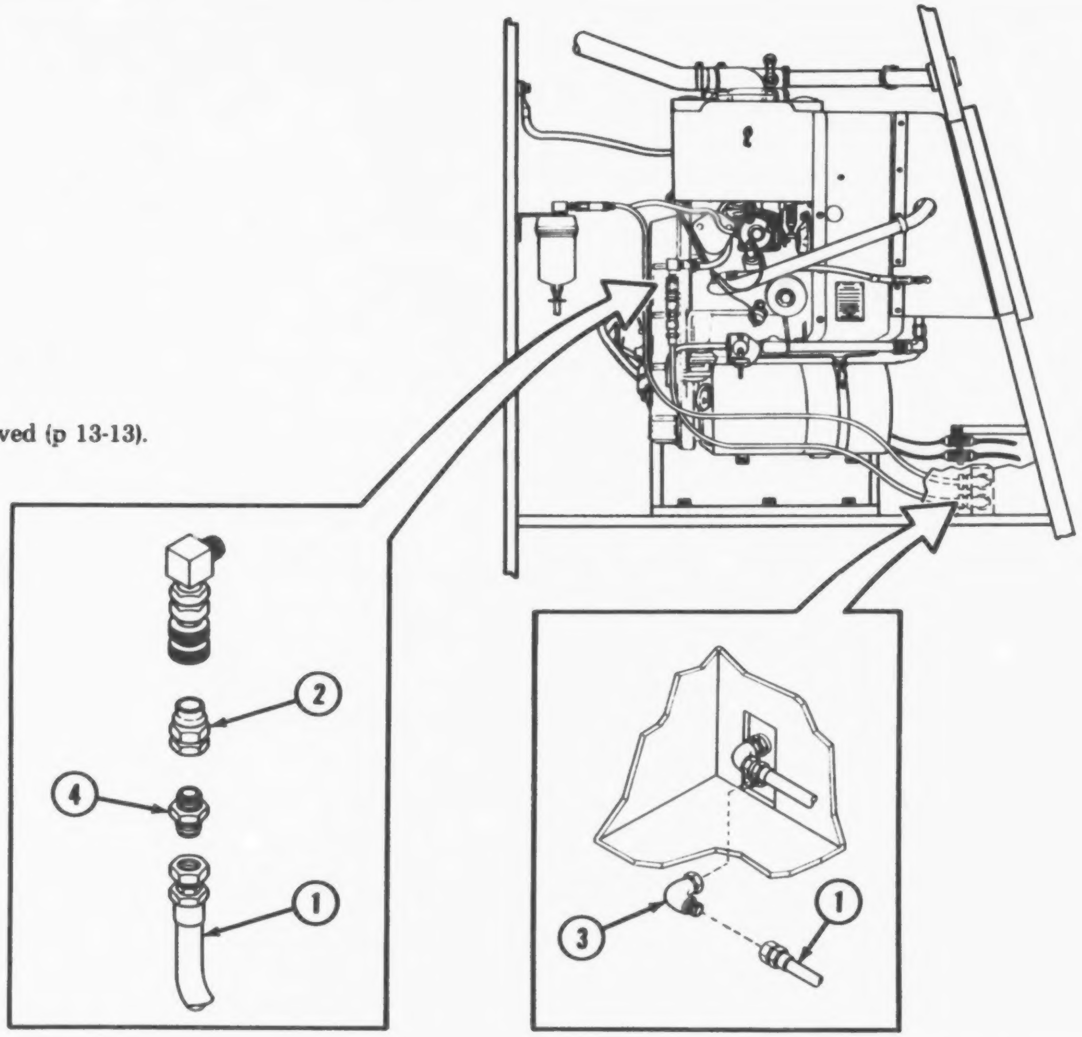
Protective caps/plugs
Teflon tape (item 62, Appx D)

References:

TM 9-2350-267-10

Equipment Condition:

APU compartment access plate removed (p 13-13).



TA57276

APU FUEL RETURN LINE (APU TO BULKHEAD): REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

- Use protective caps/plugs on all disconnected hoses and fittings.
- Use wiping rags to remove leaked fuel.

A Disconnect APU fuel return hose (1) at quick-disconnect coupling half (2).

B Disconnect APU fuel return hose (1) from bulkhead elbow (3) and remove hose (1).

C Remove quick-disconnect connector half (2) and adapter (4) from hose (1).

D Remove elbow (3) from bulkhead.

INSTALLATION

NOTE

Use Teflon tape (item 62, Appx D) on all male pipe fittings prior to installation.

A Install elbow (3) in bulkhead.

B Install hose (1) on elbow (3).

C Install quick-disconnect coupling half (2) and adapter (4) on hose (1).

D Connect quick-disconnect coupling half (2).

E Run APU (TM 9-2350-267-10). Check for fuel leaks.

TA57277

APU INLET FUEL LINE (SECONDARY FILTER TO APU): REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

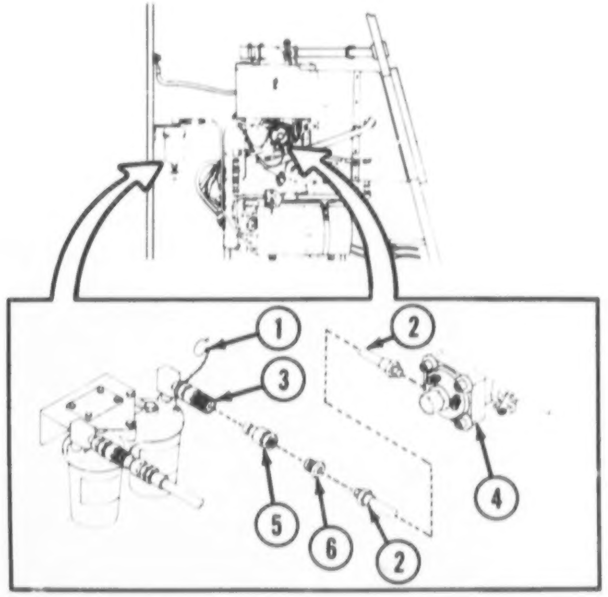
Teflon tape (item 62, Appx D)

References:

TM 9-2350-267-10

Equipment Conditions:

APU compartment access plate removed (p 13-13).



REMOVAL

A Pull retainer clip (1) and disconnect inlet fuel hose (2) at secondary filter quick-disconnect coupling half (3).

B Disconnect inlet fuel hose (2) from APU fuel injection pump assembly (4).

C Remove quick-disconnect connector half (5) from adapter (6).

D Remove adapter (6) from hose (2).

INSTALLATION

NOTE

Use Teflon tape (item 62, Appx D) on all male pipe fittings prior to installation.

A Install adapter (6) on hose (2). Install quick-disconnect connector half (5) on adapter (6).

B Connect hose (2) to fuel injection pump assembly (4).

C Connect quick-disconnect coupling halves (5 and 3).

D Place retainer clip (1) behind knurled release sleeve of quick-disconnect coupling half (3).

E Run APU (TM 9-2350-267-10). Check for fuel leaks.

TA313089

APU FUEL LINES, PUMPS AND ASSOCIATED FITTINGS (CARGO COMPARTMENT): REMOVAL AND INSTALLATION

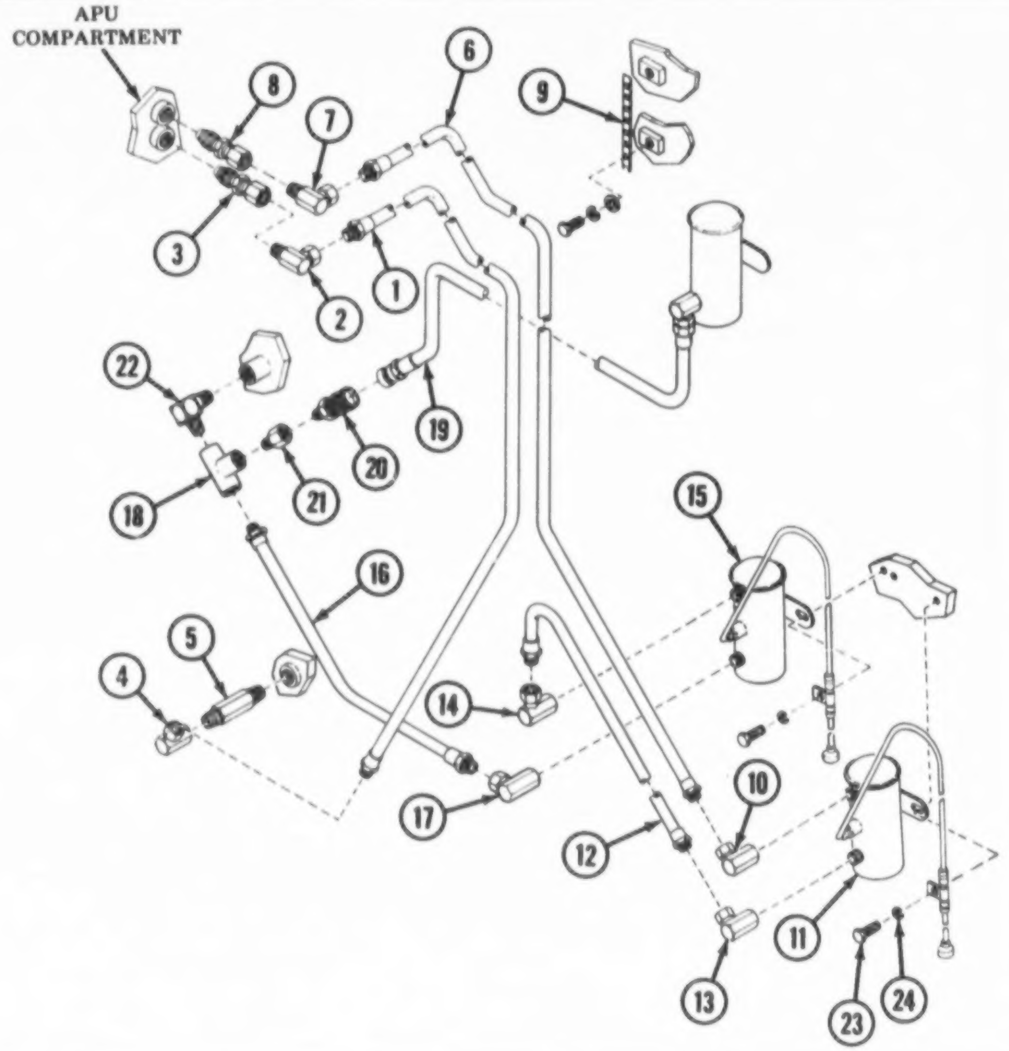
INITIAL SETUP

Materials/Parts:

Protective caps/plugs
Tape, Teflon (item 62, Appx D)
Primer, coating (item 71, Appx D)
Sealant (item 57, Appx D)

Equipment Condition:

Left projectile rack removed (p 11-5).
Ventilation blower duct removed (p 14-61).


APU COMPARTMENT
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24

TA57278

APU FUEL LINES, PUMPS AND ASSOCIATED FITTINGS (CARGO COMPARTMENT): REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

NOTE

- Use protective caps/plugs on all disconnected hoses and fittings.
- Use wiping rags to remove leaked fuel.

A Remove hose assembly (1) from elbow (2). Remove elbow (2) and adapter (3) from APU compartment bulkhead.

B Remove hose assembly (1) from elbow (4). Remove elbow (4) from nipple (5).

C Remove hose assembly (6) from elbow (7). Remove elbow (7) and adapter (8) from APU compartment bulkhead.

D Remove strap (9). Remove hose assembly (6) from elbow (10). Remove elbow (10) from fuel pump assembly (11).

E Remove hose assembly (12) from elbows (13 and 14). Remove elbows (13 and 14) from fuel pumps (11 and 15).

F Remove hose assembly (16) from elbow (17). Remove elbow (17) from pump (15).

G Remove hose assembly (16) from tee (18).

H Disconnect hose assembly (19) at quick-disconnect half (20).

I Remove quick-disconnect half (20) from adapter (21).

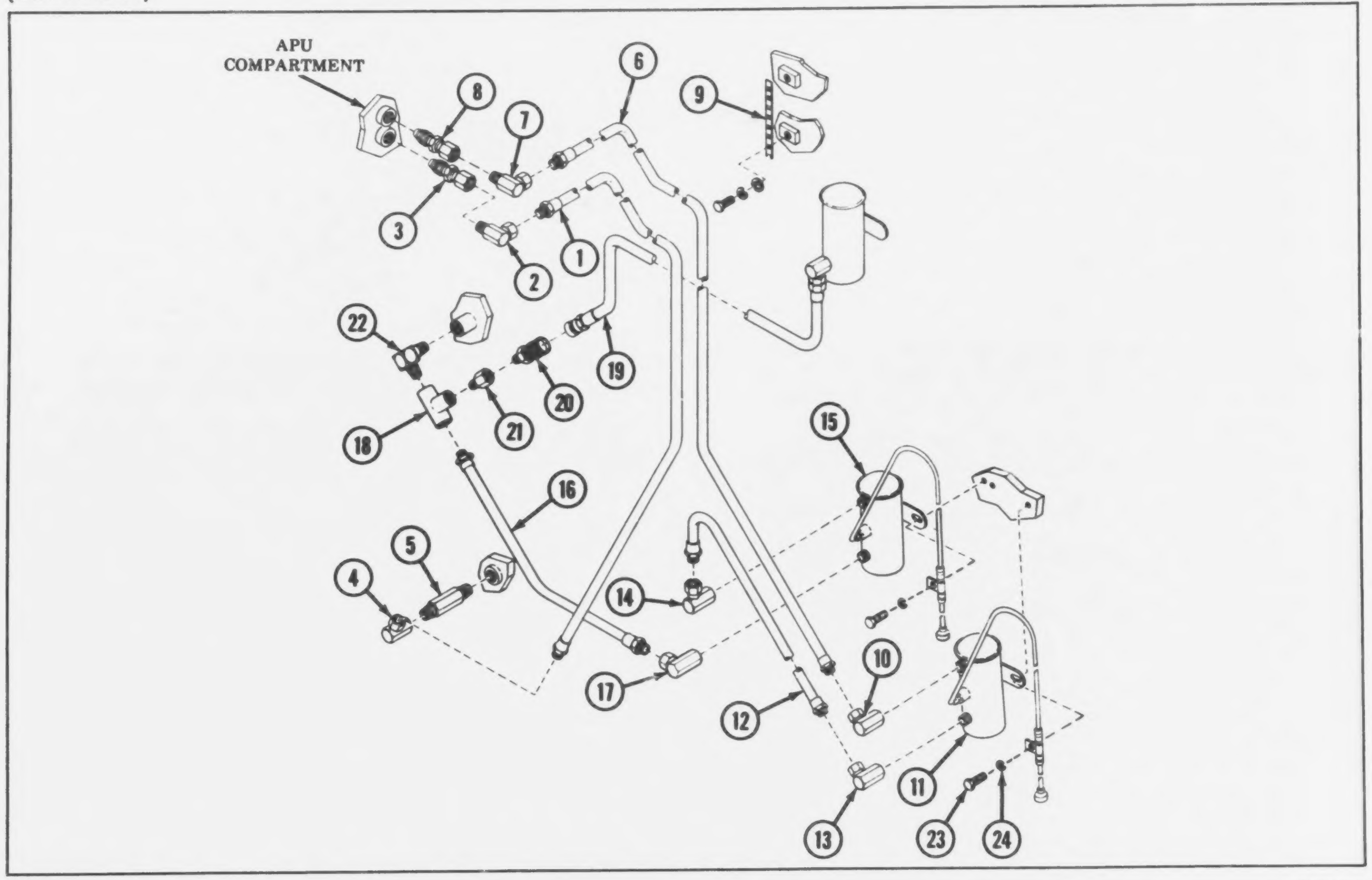
J Remove adapter (21) from tee (18).

K Remove tee (18) from elbow (22) and remove elbow (22) from bulkhead.

L Disconnect electrical connections and remove fuel pumps (11 and 15) from bulkhead by removing from each, two screws (23), and two lockwashers (24). Discard lockwashers.

TA57279

APU FUEL LINES, PUMPS AND ASSOCIATED FITTINGS (CARGO COMPARTMENT): REMOVAL AND INSTALLATION (CONTINUED)


APU COMPARTMENT
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24

TA57280

APU FUEL LINES, PUMPS AND ASSOCIATED FITTINGS (CARGO COMPARTMENT): REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

NOTE

- Apply sealant (item 57, Appx D) to all male pipe threads.
- Apply coating primer (item 71, Appx D) to contacting surfaces of adapters (3 and 8).

A Install fuel pump (11), two new lockwashers (24), and two screws (23).

B Install fuel pump (15), two new lockwashers (24), and two screws (23).

C Connect electrical connections to fuel pumps (11 and 15).

D Install elbow (22) and tee (18).

E Install adapter (21) to tee (18).

F Connect quick-disconnect half (20) to adapter (21).

G Connect hose assembly (19) to quick-disconnect half (20).

H Connect hose assembly (16) to tee (18).

I Install elbow (17) in pump (15) and attach hose assembly (16) in elbow (17).

J Install elbows (13 and 14) in pumps (11 and 15).

K Connect hose assembly (12) to elbows (13 and 14).

L Install elbow (10) in pump assembly (11).

M Connect hose assembly (6) to elbow (10).

N Secure hose assembly (6) to bulkhead by installing strap (9).

O Install adapter (8) and elbow (7) to APU compartment bulkhead.

P Attach hose assembly (6) to elbow (7).

Q Install elbow (4) on nipple (5).

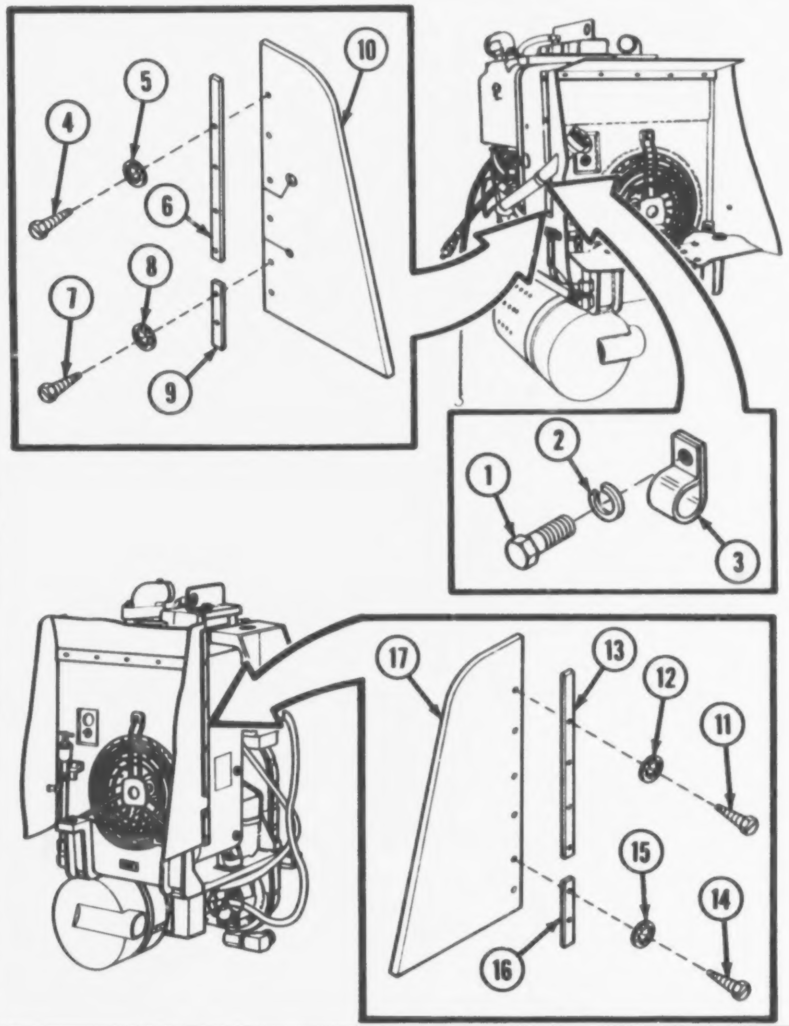
R Connect hose assembly (1) to elbow (4).

S Install adapter (3) and elbow (2) to APU compartment bulkhead.

T Connect hose assembly (1) to elbow (2).

TA57282

APU PANELS: REMOVAL AND INSTALLATION



REMOVAL

NOTE

APU with support stand must be removed before left panel can be removed. Access to right panel, top panel and panel duct can be obtained through APU compartment front and side doors.

LEFT PANEL

A Remove screw (1) and lockwasher (2) from clamp assembly (3). Discard lockwasher.

B Remove three screws (4), three lockwashers (5) and retainer (6). Discard lockwashers.

C Remove two screws (7), two lockwashers (8) and retainer (9). Discard lockwashers.

D Remove left panel (10).

RIGHT PANEL

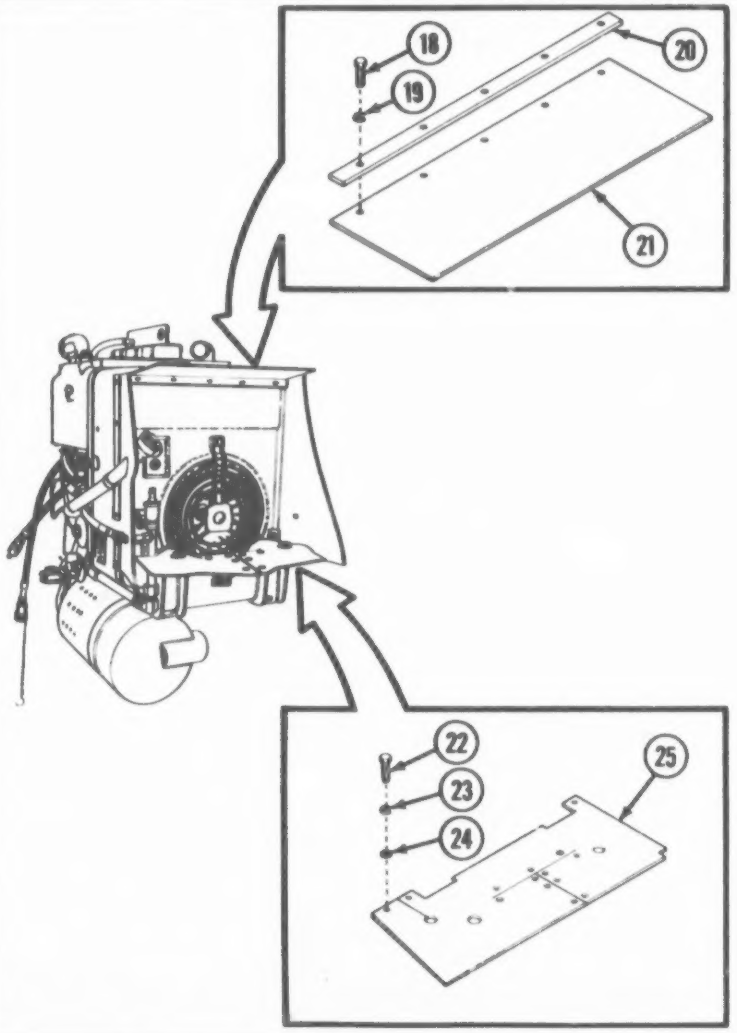
E Remove four screws (11), four lockwashers (12) and retainer (13). Discard lockwashers.

F Remove two screws (14), two lockwashers (15) and retainer (16). Discard lockwashers.

G Remove panel (17).

TA313090

APU PANELS: REMOVAL AND INSTALLATION (CONTINUED)



TOP PANEL

H Remove five screws (18), five lockwashers (19) and retainer (20). Discard lockwashers.

I Remove top panel (21).

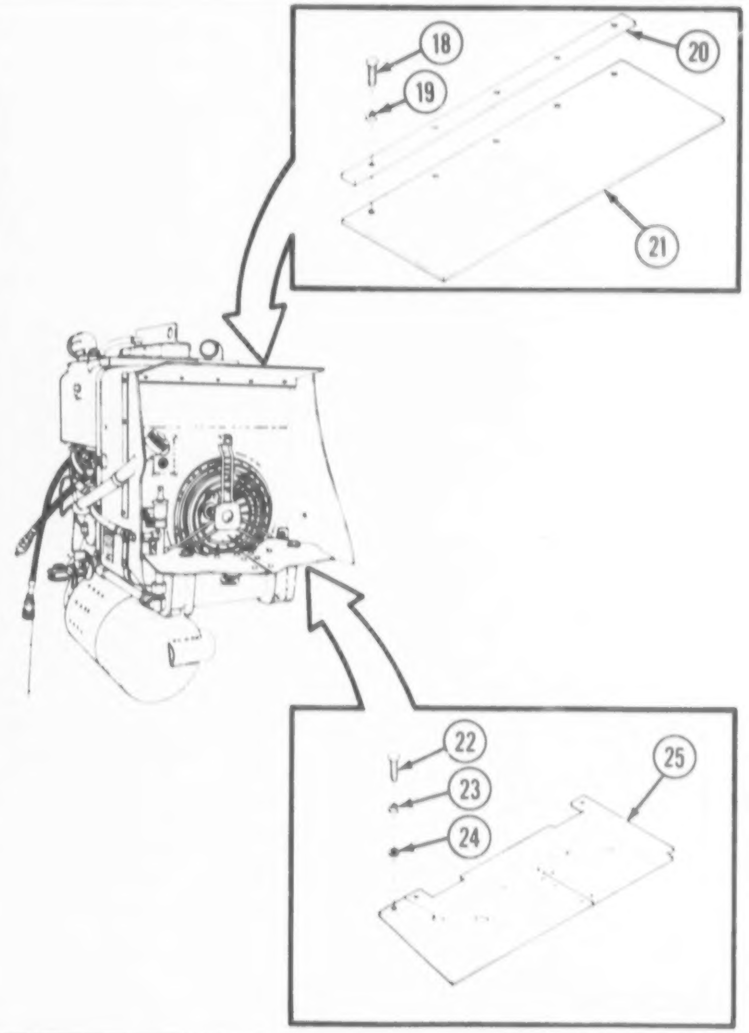
PANEL DUCT

J Remove three screws (22), three lockwashers (23) and three flat washers (24). Discard lockwashers.

K Remove panel duct (25).

TA313091

APU PANELS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

PANEL DUCT

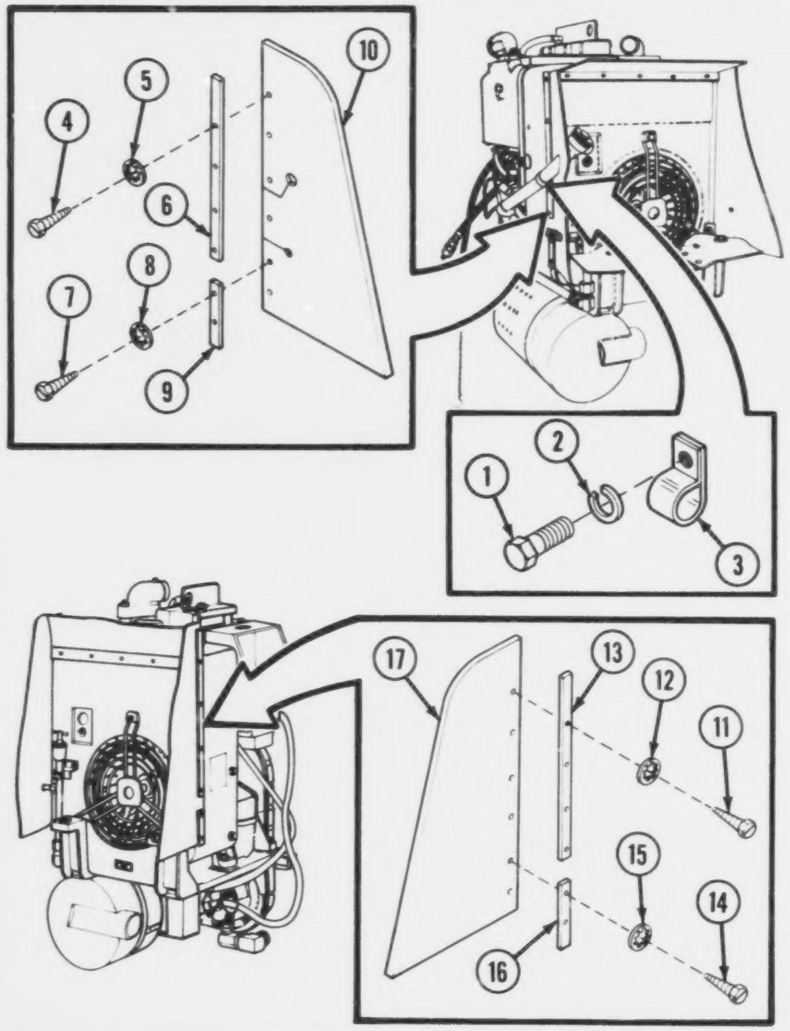
A Install panel duct (25) with three screws (22), three new lockwashers (23) and three flat washers (24).

TOP PANEL

B Install top panel (21) and retainer (20) with five screws (18) and five new lockwashers (19).

TA313092

APU PANELS: REMOVAL AND INSTALLATION (CONTINUED)



RIGHT PANEL

C Install right panel (17) and retainer (16) with two screws (14) and two new lockwashers (15).

D Install retainer (13) with four screws (11) and four new lockwashers (12).

LEFT PANEL

E Install left panel (10) and retainer (9) with two screws (7) and two new lockwashers (8).

F Install retainer (6) with three screws (4) and three new lockwashers (5).

G Install clamp (3) with screw (1) and new lockwasher (2).

TA313093

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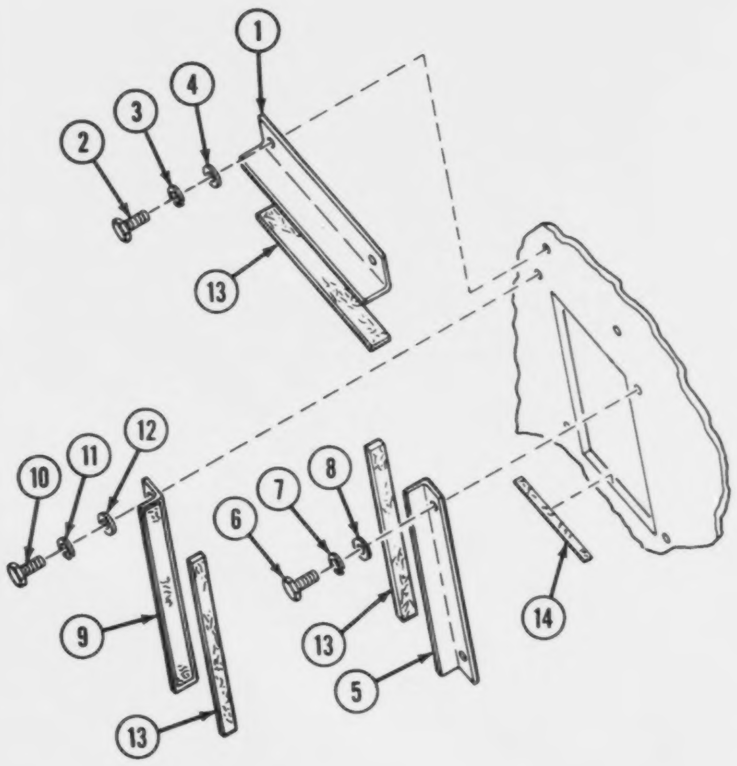
APU PANEL SUPPORTS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Remove APU (p 13-1).

B Remove support (1) by removing two screws (2), two lockwashers (3) and two flat washers (4).

C Remove support (5) by removing two screws (6), two lockwashers (7) and two flat washers (8).

D Remove support (9) by removing two screws (10), two lockwashers (11) and two flat washers (12).

DISASSEMBLY

A Remove three hook-and-pile tape sections (13) from supports (1, 5 and 9) and one hook-and-pile tape section (14) from vehicle front plate using a suitable scraper.

B Thoroughly clean support and front plate surfaces with dry-cleaning solvent (item 19, Appx D) and clean, dry rags (item 50, Appx D).

ASSEMBLY

A Apply thin coat of adhesive (item 6, Appx D) to mounting surface of supports (1, 5 and 9) and front plate (14). Allow to dry until tacky.

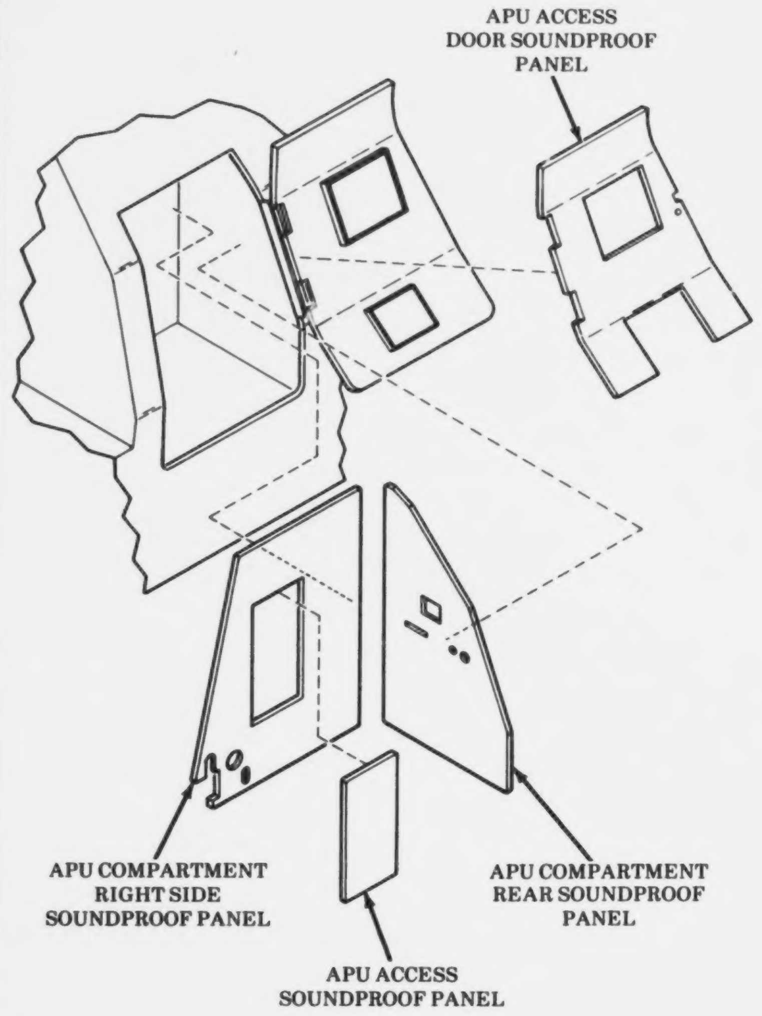
B Install pre-coated hook-and-pile tape sections on supports and front plate.

INSTALLATION

Reverse removal procedures.

TA309978

APU COMPARTMENT SOUNDPROOF PANELS: REMOVAL AND INSTALLATION


APU ACCESS
DOOR SOUNDPROOF
PANEL
APU COMPARTMENT
RIGHT SIDE
SOUNDPROOF PANEL
APU COMPARTMENT
REAR SOUNDPROOF
PANEL
APU ACCESS
SOUNDPROOF PANEL

REMOVAL

NOTES

To remove rear panel remove: APU fuel filters (p 13-16), hydraulic pressure switch (p 13-17), APU ground lead (p 13-1) and hydraulic lines and elbows (p 13-1).

To remove right side panel remove: APU fuel lines and elbows (p 13-26).

The following procedures apply to all soundproof panels in APU compartment. Do not remove APU to replace APU door soundproof panel.

A Remove APU from vehicle (p 13-1).

B Pull and scrape defective panel off interior wall or side door of APU compartment.

C Thoroughly clean adhesive from wall or door area with dry-cleaning solvent (item 19, Appx D) and clean, dry rags (item 50, Appx D). Be sure to remove all particles.

INSTALLATION

A Apply thin coat of adhesive (item 4, Appx D) to back (smooth, non-matted) side of soundproof panel.

B Allow adhesive to dry until tacky.

C Mount panel to wall or door panel.

NOTE

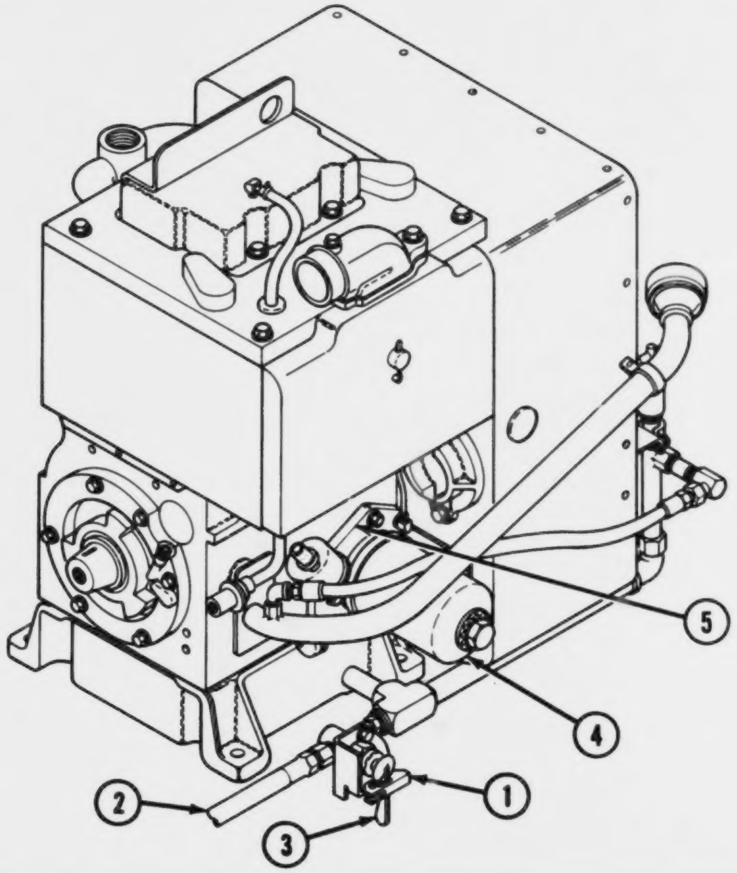
For best installation results, pressure should be applied evenly to all outside surfaces.

TA309979

Section II APU OIL FILTER

This section contains removal and installation instructions for the APU oil filter.

APU OIL FILTER: REMOVAL AND INSTALLATION



REMOVAL

A Open catch (1). Use suitable container under drain valve hose (2) and turn key (3) counterclockwise to drain oil from APU.

B Remove oil filter (4) by turning counterclockwise and discard.

INSTALLATION

A Install new oil filter (4) by turning clockwise until filter gasket contacts adapter plate (5), then turn one half turn.

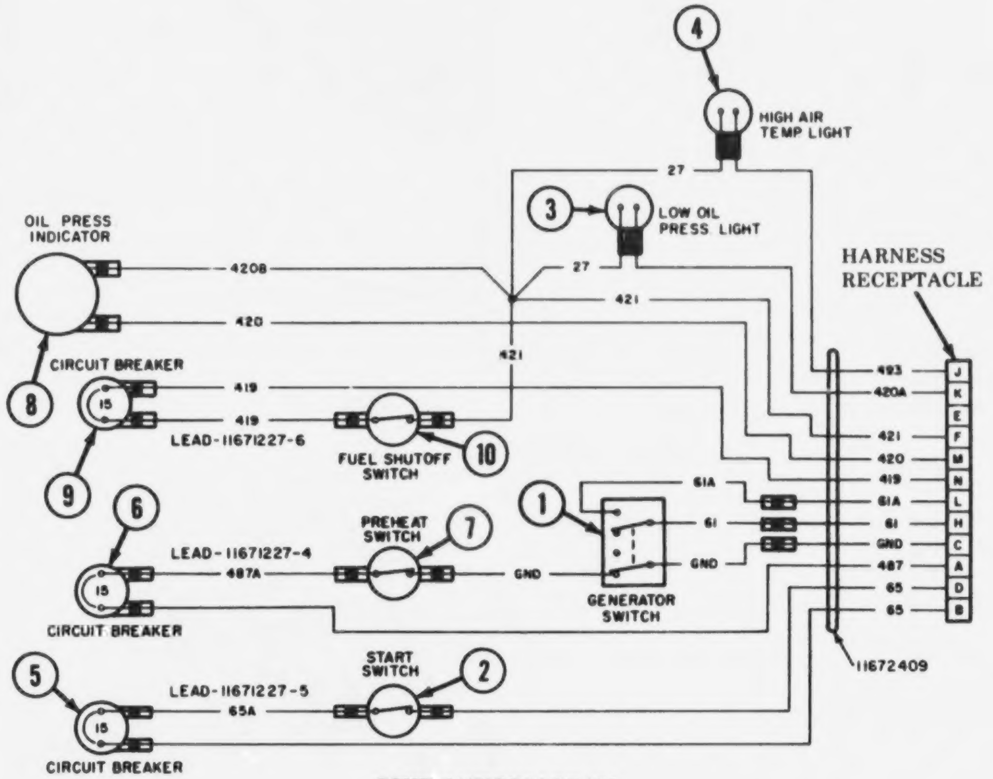
B Close drain valve (3) by turning clockwise and secure with catch (1).

C Fill APU with oil. Check oil level (LO 9-2350-267-12).

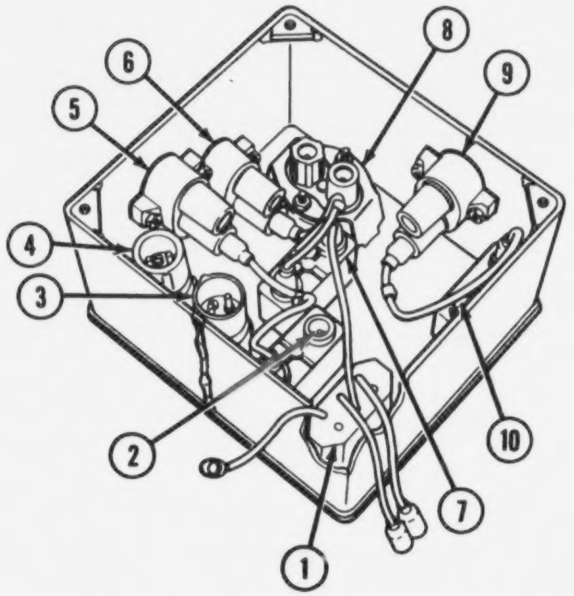
TA309980

Section III APU POWER UNIT CONTROL BOX

APU CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY, CIRCUIT TEST AND INSTALLATION


4
HIGH AIR TEMP LIGHT
27
3
LOW OIL PRESS LIGHT
OIL PRESS INDICATOR
4208
27
421
420
421
HARNESS RECEPTACLE
CIRCUIT BREAKER
8
15
419
419
LEAD-11671227-6
FUEL SHUTOFF SWITCH
10
9
6
1
61A
61
GND
PREHEAT SWITCH
7
LEAD-11671227-4
487A
GND
GENERATOR SWITCH
15
CIRCUIT BREAKER
493
420A
421
420
419
61A
61
GND
487
65
65
J
K
E
F
M
N
L
H
C
A
D
B
11672409
5
START SWITCH
2
LEAD-11671227-5
65A
15
CIRCUIT BREAKER

SCHEMATIC DIAGRAM


6
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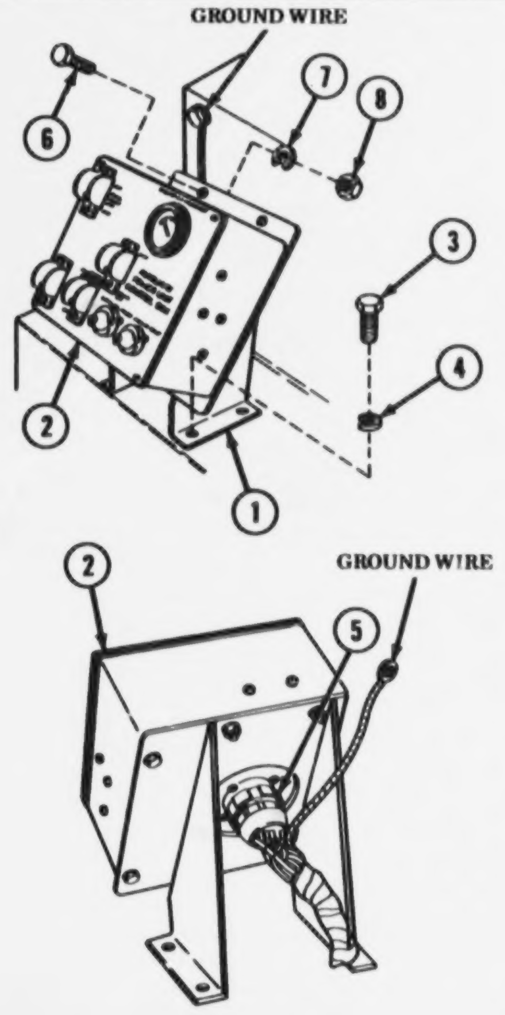
1

LEGEND

1	APU GENerator switch
2	START switch
3	LOW OIL PRESSure warning light
4	HIGH AIR TEMP warning light
5	Circuit breaker
6	Circuit breaker
7	PREHEAT switch
8	ENGINE OIL PRESSURE gage
9	Circuit breaker
10	FUEL SHUTOFF switch

TA309981

APU CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY, CIRCUIT TEST AND INSTALLATION (CONTINUED)



REMOVAL

WARNING

Turn OFF MASTER switch. Disconnect battery ground cables.

A Remove M2A2 air purifier (p 14-3).

B Remove bracket (1) with attached APU control box (2) by removing four screws (3) and four washers (4). Disconnect harness ground wire.

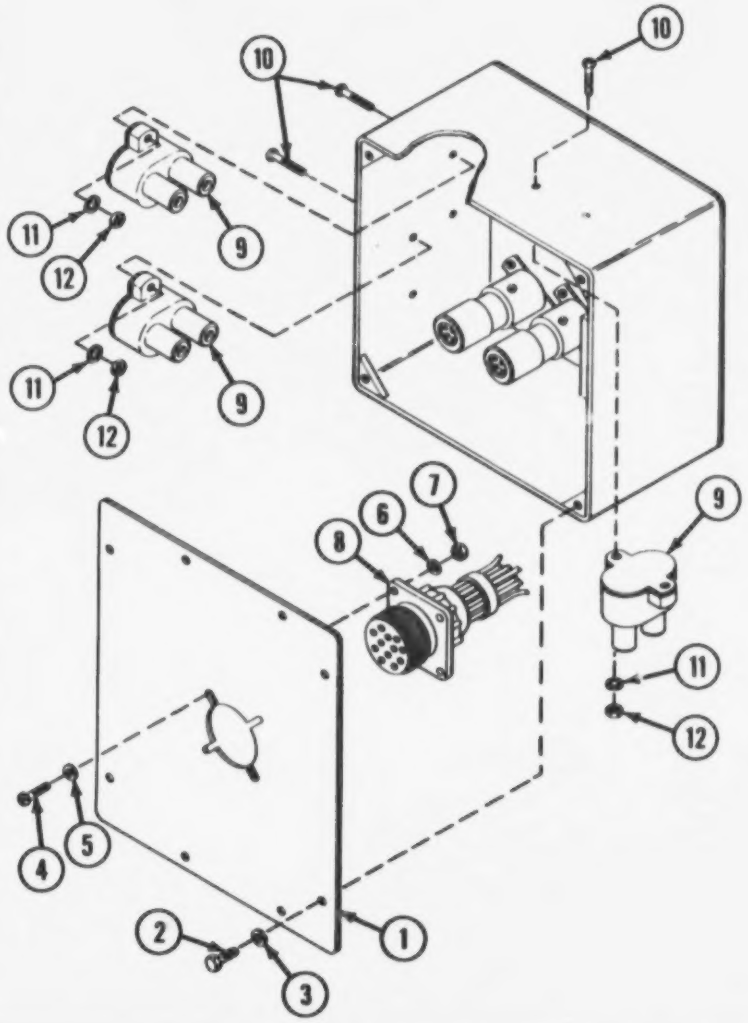
C Disconnect electrical wiring harness connector (5) from APU control box (2).

D Remove APU control box (2) from bracket (1) by removing four screws (6), four lockwashers (7) and four nuts (8).

E Do circuit continuity test (p 13-39) and short circuit test (p 13-40). Replace any defective components during disassembly.

TA309982

APU CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY, CIRCUIT TEST AND INSTALLATION (CONTINUED)



DISASSEMBLY

A Remove rear panel (1) by removing four screws (2) and four washers (3).

B Remove four screws (4), four flat washers (5), four lockwashers (6) and four nuts (7), and remove wiring harness connector (8) from rear panel (1).

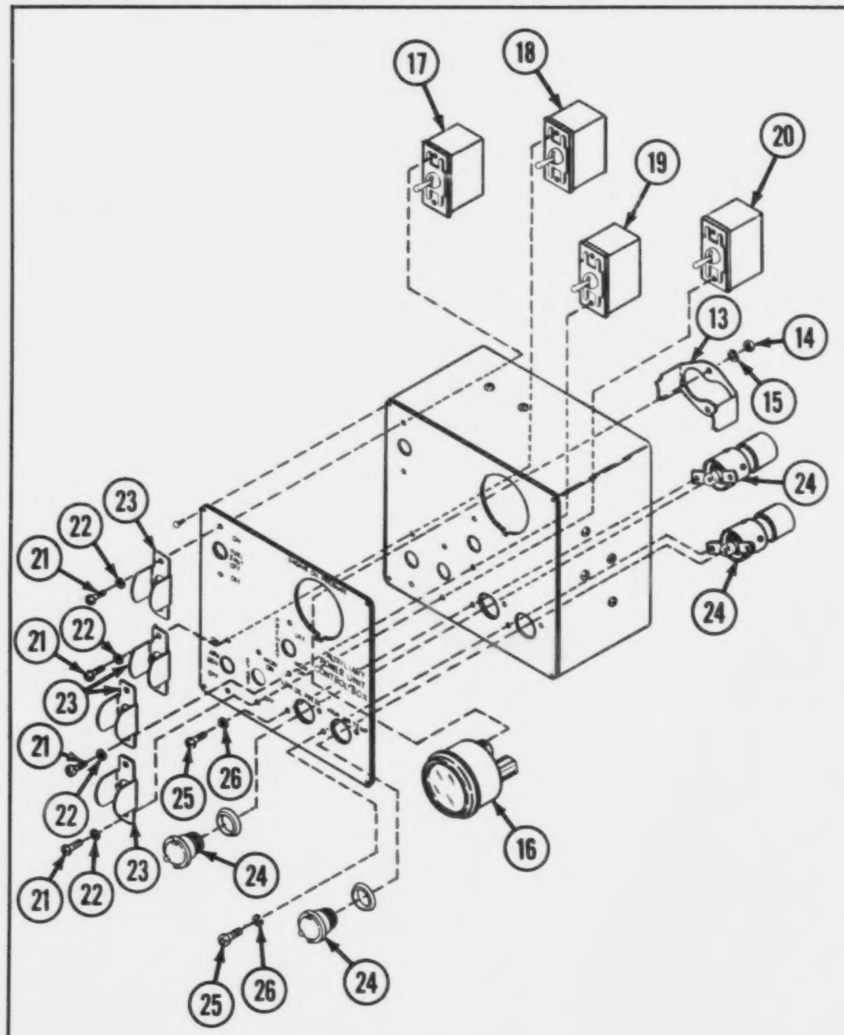
C Remove wiring harness (8) by pulling harness connectors from control box components.

D Disconnect and remove remaining wires from switches, circuit breakers and connectors inside box.

E Remove three circuit breakers (9) by removing from each, two screws (10), two lockwashers (11) and two nuts (12).

TA309983

APU CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY, CIRCUIT TEST AND INSTALLATION (CONTINUED)



F Remove engine oil pressure gage bracket (13) by removing two nuts (14) and two lockwashers (15) from rear of gage box.

G Remove ENGINE OIL PRESSURE gage (16) from front of control box.

H Remove FUEL SHUTOFF switch (17), APU GENerator switch (18), PREHEAT switch (19) and START switch (20) by removing from each, two screws (21), two lockwashers (22) and one guard (23).

I Remove LOW OIL PRESSure and HIGH AIR TEMPerature lights (24) by removing from each, two screws (25) and two lockwashers (26).

ASSEMBLY

A Reverse disassembly procedures.

B For wiring harness installation/connection use diagram on p 13-35.

TA309984

APU CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY, CIRCUIT TEST AND INSTALLATION (CONTINUED)

NO. 1 Ohmmeter Connect	No. 2 Switch and Position	No. 3 Resistance (Ohms)	No. 4 Using a Digital Multi-Meter (Ohms)
A to C	PREHEAT – ON APU GENerator – OFF	0	0
A to C	PREHEAT – OFF	Infinity	Infinity
B to D	START – ON	0	0
B to D	START – OFF	Infinity	Infinity
F to K	None	115 to 150 (bulb resistance)	30 to 35
F to J	None	115 to 150 (bulb resistance)	30 to 35
F to M	None	175±5	175±5
L to H	APU GENerator – ON	0	0
L to H	APU GENerator – OFF	Infinity	Infinity
F to N	FUEL SHUTOFF – ON	0	0
F to N	FUEL SHUTOFF – OFF	Infinity	Infinity
M to box ground	None	32±5	32±5

CIRCUIT CONTINUITY TEST

A Connect an ohmmeter between pins indicated in column 1.

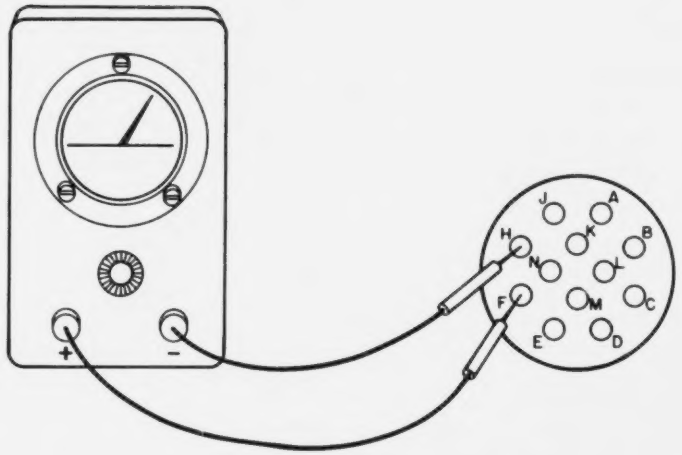
B Set switches in positions indicated in column 2.

C Ohmmeter should indicate resistance shown in column 3.

D If meter doesn't indicate readings in column 3 or 4, check each circuit wire, switch and circuit breaker using schematic and illustration on p 13-35 as guide. Replace any defective components.

TA309985

APU CONTROL BOX: REMOVAL, DISASSEMBLY, ASSEMBLY, CIRCUIT TEST AND INSTALLATION (CONTINUED)



SHORT CIRCUIT TEST

A Place all switches in OFF position.

B Check for continuity between points listed below. Multimeter should indicate continuity. Points that should not indicate continuity are listed under Exceptions column.

RED PROBE	BLACK PROBE	EXCEPTIONS
A	ALL OTHER PINS	NONE
B	ALL OTHER PINS	NONE
C	ALL OTHER PINS	NONE
D	ALL OTHER PINS	NONE
F	ALL OTHER PINS	F TO K, F TO J, F TO M
H	ALL OTHER PINS	NONE
J	ALL OTHER PINS	J TO M, J TO F, J TO K
K	ALL OTHER PINS	K TO F, K TO GROUND
L	ALL OTHER PINS	NONE
M	ALL OTHER PINS	M TO J, M TO K, M TO F
N	ALL OTHER PINS	NONE
CONNECTOR BODY	ALL OTHER PINS	BODY TO F, BODY TO M

C If meter indicates short circuit, use schematic and illustration (p 13-35) to check internal wiring, circuit breakers and switches.

INSTALLATION

Reverse removal procedures.

TA309986

CHAPTER 14
MAINTENANCE PROCEDURES
NUCLEAR, BIOLOGICAL, CHEMICAL (NBC), AUTOMATIC FIRE EXTINGUISHER SYSTEM (AFES), VENTILATION SYSTEM, AND BILGE PUMP

CHAPTER OVERVIEW

This chapter illustrates and describes procedures for removal, disassembly, assembly and installation of the following systems:

Section I	NBC Ventilated Face Piece and Detection/Alarm System
Section II	Automatic Fire Extinguisher System (AFES)
Section III	Heating, Ventilating and Bilge Pumping Systems
Section IV	Personnel Heater
Section V	Bilge Pump

GENERAL INSPECTION AND REPAIR PROCEDURES

The mechanic will perform a visual inspection of personnel heater, fire extinguisher and ventilation systems during removal and disassembly.

During inspection, look for the following conditions and take the appropriate indicated action:

- Check for cracked, damaged or deteriorated hose, tubes and ducts.

  Replace if necessary.

- Check for leaks at personnel heater fuel line connector.

  Replace connector assemblies if needed.

- Check for frayed, deteriorated or broken electrical leads.

  Notify Support Maintenance as required.

- Check for broken, damaged or loose-fitting retainer straps and brackets.

  Repair or replace; notify Support Maintenance as required.

- Check for signs of shorted electrical circuits at terminal boards/connector assemblies.

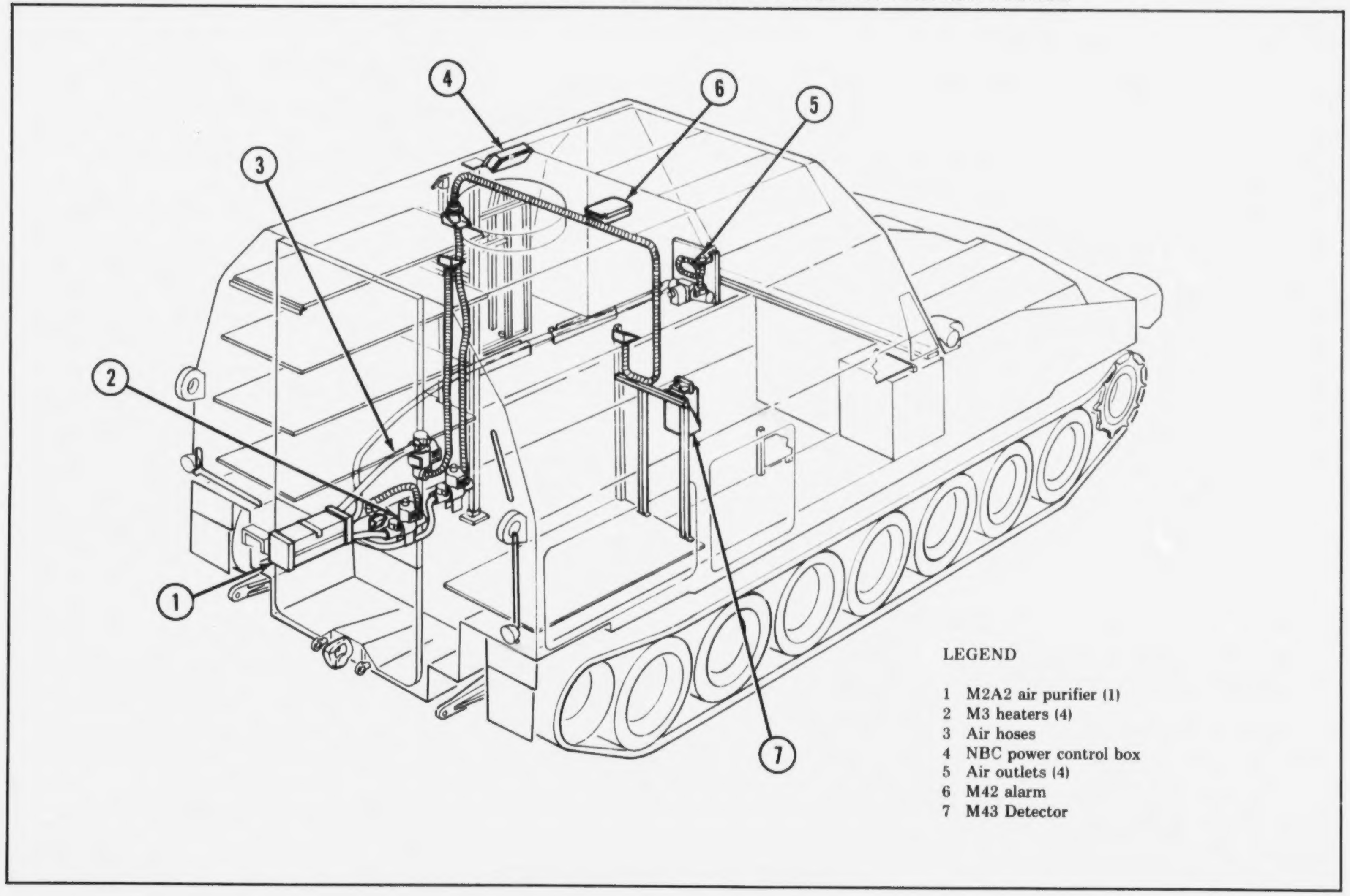
  Repair lead terminals, replace terminal boards or notify Support Maintenance as required.

- Check for signs of burns, heat discoloration, or damaged heater housing and components.

  Notify Support Maintenance as required.

TA313094

Section I NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM

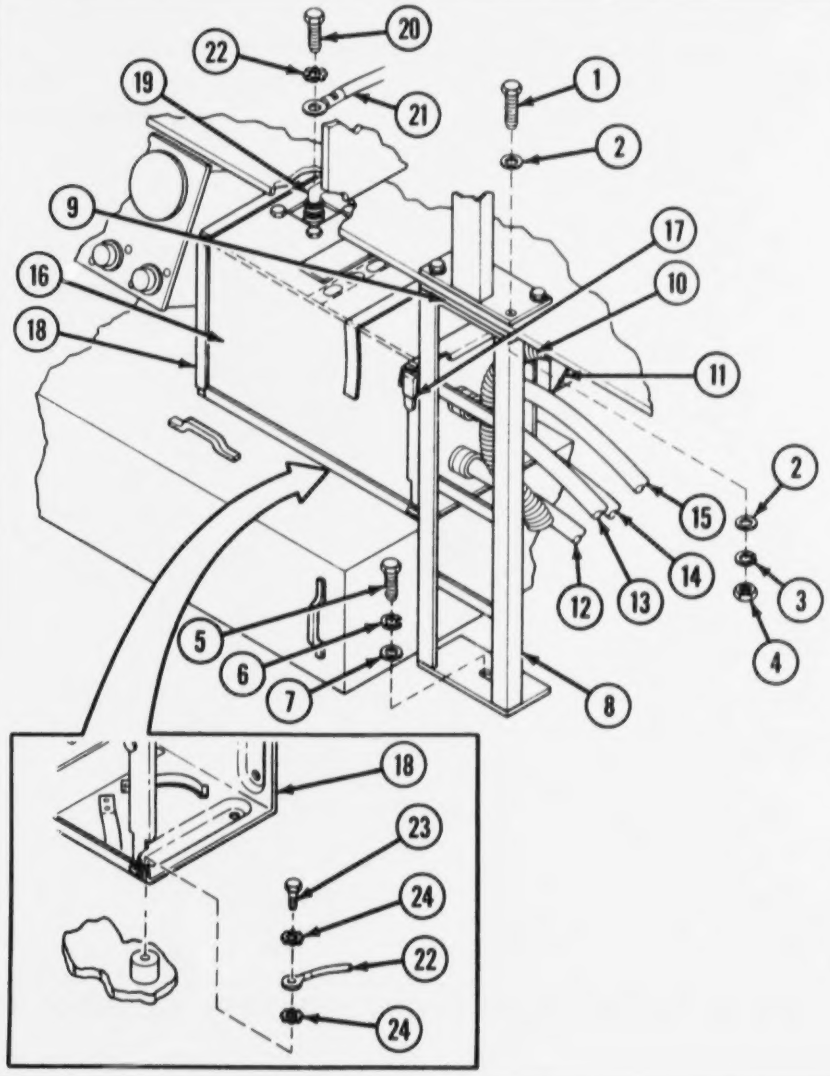


LEGEND

1 M2A2 air purifier (1)
2 M3 heaters (4)
3 Air hoses
4 NBC power control box
5 Air outlets (4)
6 M42 alarm
7 M43 Detector

TA310676

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)



M2A2 AIR PURIFIER

REMOVAL

A Remove two screws (1), four flat washers (2), two lockwashers (3) and two nuts (4). Discard lockwashers.

NOTE

Note number of shims to ensure proper installation.

B Remove screw (5), lockwasher (6), flat washer (7), guard (8) and shims (9) (if applicable) from vehicle floor and canister rack. Discard lockwasher.

C Disconnect air hose (10) from air outlet connector (11).

D Remove quick-disconnect hoses (12, 13, 14 and 15) from manifold of air purifier assembly (16).

E Release strap (17).

F Remove air purifier assembly (16) from bracket (18).

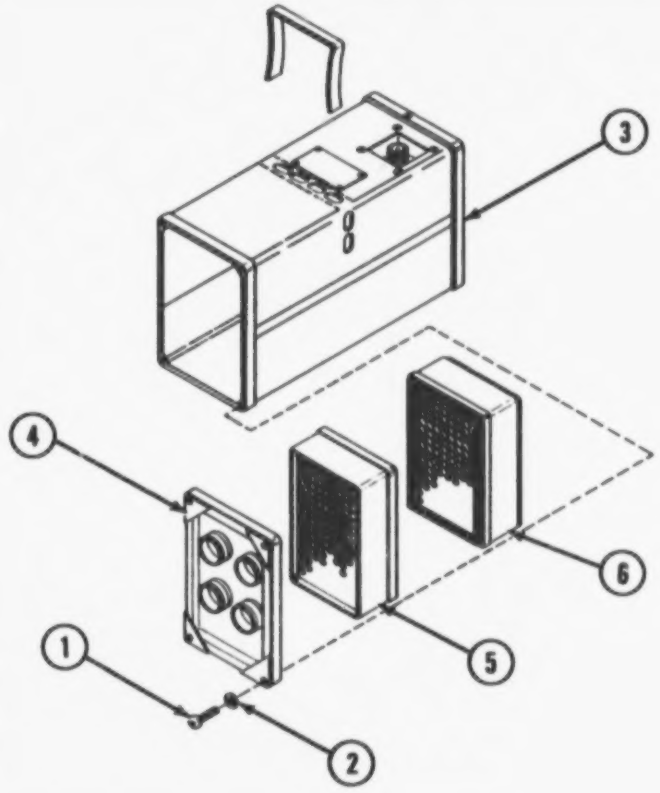
G Disconnect electrical elbow connector (19) from air purifier assembly (16).

H Remove screw (20) and lockwasher (21), and disconnect ground wire (22). Discard lockwasher.

I Remove four screws (23), five lockwashers (24), ground wire (22) and bracket (18). Discard lockwashers.

TA57492

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)



DISASSEMBLY

A Remove four screws (1) and four lockwashers (2) from housing (3).

B Remove manifold (4).

CAUTION

Do not allow moisture to come in contact with filter material.

C Tilt housing (3) and remove gas filter (5) and particulate filter (6).

NOTE

If filters are to be reused, mark arrow on side showing direction of air flow.

WARNING

To prevent possible chemical or biological agent casualties, contaminated gas and particulate filters must be removed and disposed of only by adequately trained personnel (FM 21-40). The unit commander or senior officer in charge of maintenance personnel assigned to remove and dispose of contaminated gas filters must prescribe necessary protective clothing (TM 10-277) to be worn during this operation. The officer must also prescribe necessary safety measures, including decontamination, that must be performed before new gas filters are installed in housing assembly (TM 3-220).

CLEANING

Clean manifold, housing and filters with clean, damp cloth (item 16, Appx D).

TA310678

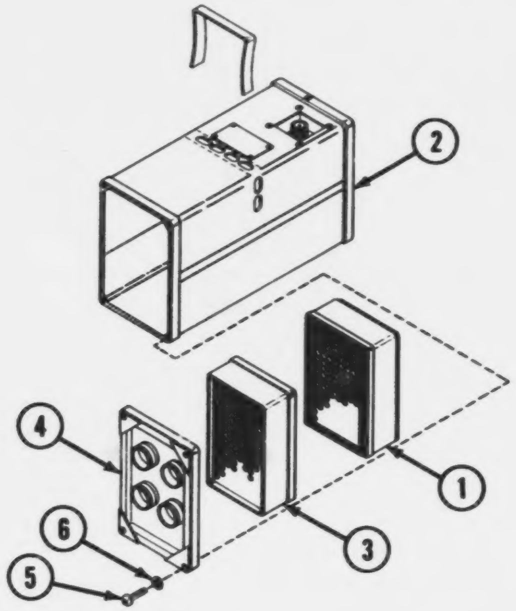
NBC VENTILATED FACE PIECE AND DETECTOR/ALARM SYSTEM (CONTINUED)

INSPECTION AND REPAIR

A Inspect housing for damage and replace if damaged.

B Inspect manifold, air outlet sockets and socket packings for damage. Replace manifold if damaged.

C Inspect filters for damage and replace if damaged.



ASSEMBLY

NOTE

Make sure filter rests against bulkhead inside housing.

A Install particulate filter (1) in housing (2) so air will flow through it in direction marked on filter housing.

NOTE

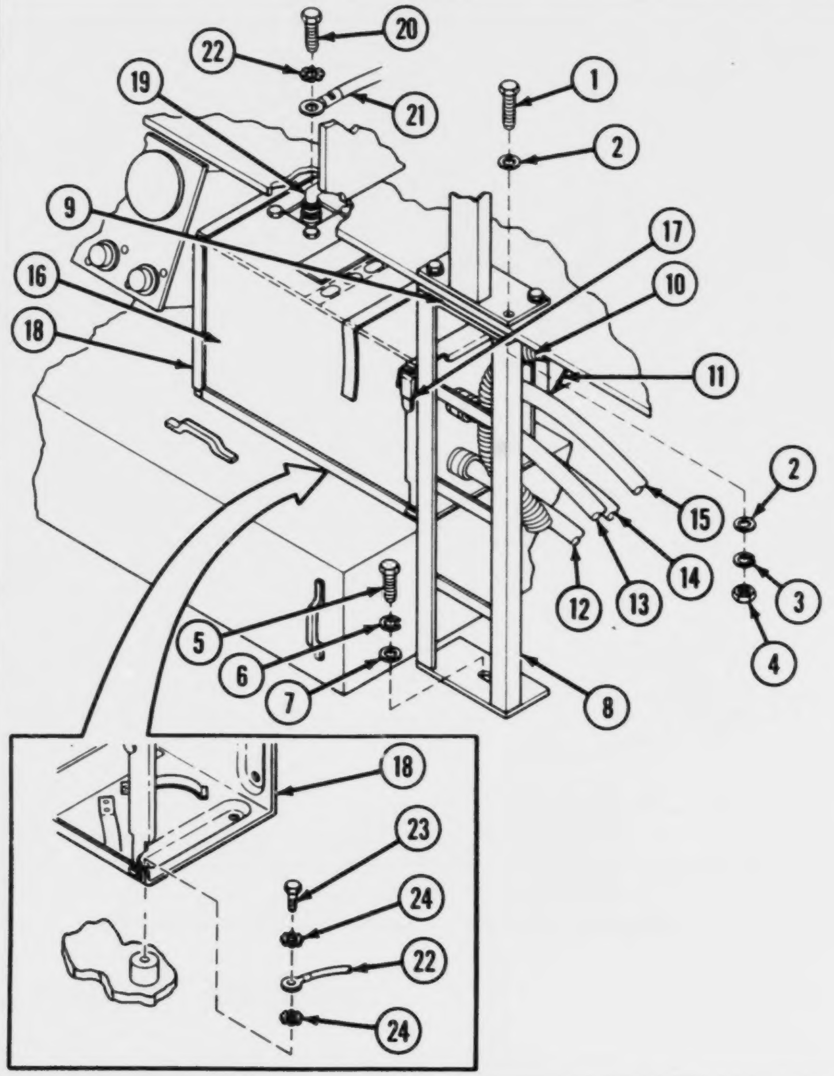
Make sure felt gasket side of gas filter is toward manifold assembly end of purifier.

B Install gas filter (3) in housing (2) so it rests on gasket of particulate filter (1) surface.

C Install manifold (4) in housing (2) with four screws (5) and four lockwashers (6).

TA310679

NBC VENTILATED FACE PIECE AND DETECTOR/ALARM SYSTEM (CONTINUED)



INSTALLATION

A Install bracket (18) and one end of ground wire (22) with four screws (23) and five new lockwashers (24).

B Place purifier assembly (16) on bracket (18) and install ground wire (22) terminal with screw (20) and new lockwasher (21).

C Lift strap (17) and install air purifier assembly (16) in bracket (18) and secure with strap (17).

D Install elbow connector (19) in purifier assembly (16).

E Install hoses (12, 13, 14 and 15) on manifold connection of air purifier (16).

F Reconnect air hose (10) to air outlet connector (11).

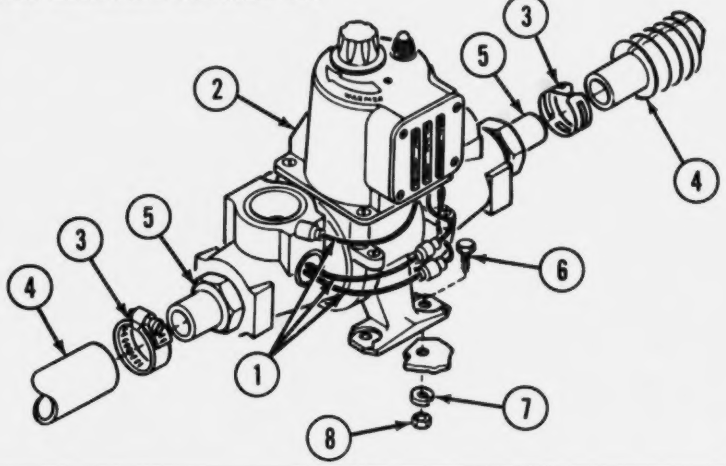
G Install shims (9) (if applicable) and guard (8) to vehicle floor with screw (5), new lockwasher (6) and flat washer (7).

H Secure guard (8) and shims (9) to canister rack with two screws (1), four flat washers (2), two new lockwashers (3) and two nuts (4).

TA57493

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

AIR ELECTRIC HEATER M3



REMOVAL

A Disconnect three wires (1) from heater (2).

B Loosen two clamps (3). Slide clamps (3) back over two hoses (4).

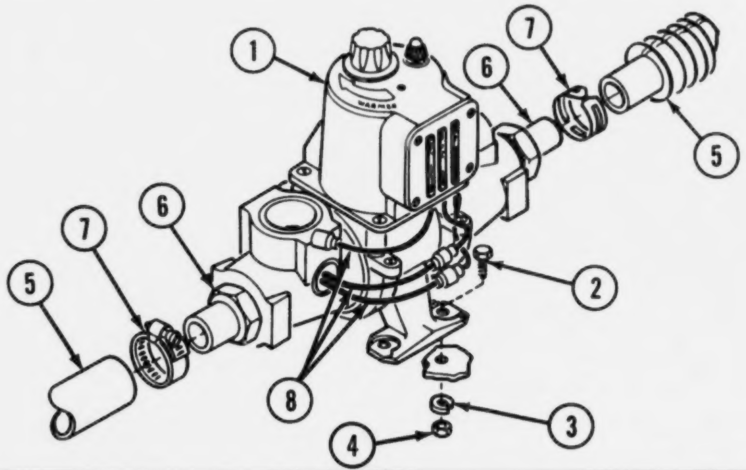
C Pull two hoses (4) free from two adapters (5).

NOTE

Heater at commander's station has four screws and four lockwashers.

D Remove four screws (6), four lockwashers (7) and four nuts (8).

E Remove heater (2).



INSTALLATION

A Install heater (1) with four screws (2), four lockwashers (3) and four nuts (4).

B Apply thin coat of adhesive sealant (item 2, Appx D) to inside surface of hose (5) ends. Install two hoses (5) on two adapters (6).

C Slide two clamps (7) over two adapters (6).

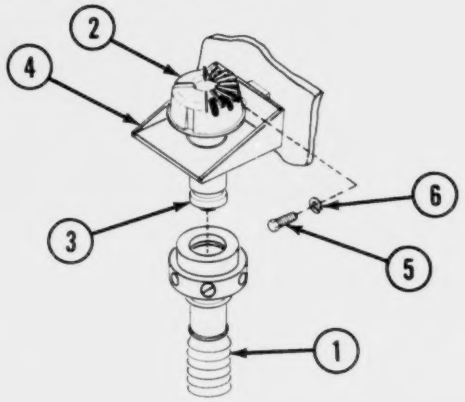
D Tighten two clamps (7).

E Connect three wires (8) to heater (1).

TA310681

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

AIR OUTLET ORIFICE CONNECTOR



REMOVAL

A Remove hose assembly (1) from connector (2).

B Remove external retaining ring (3) (hidden).

C Remove connector (2) from bracket (4).

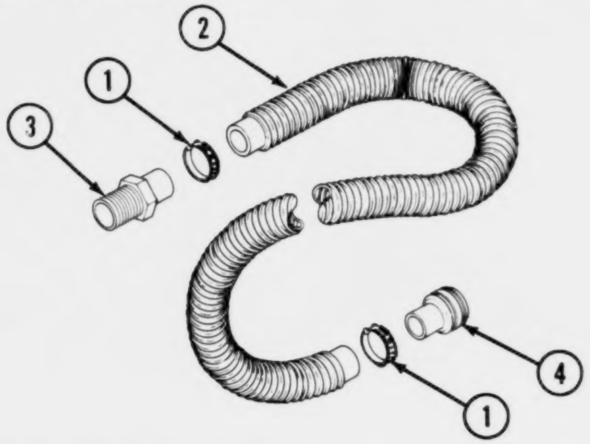
D Remove screw (5) and lockwasher (6).

E Remove bracket (4).

INSTALLATION

Reverse removal procedure.

HOSE ASSEMBLIES



REMOVAL

A Loosen two clamps (1).

B Pull hose (2) free from adapter (3) and coupling half (4).

CLEANING

Clean hose (2) with warm soapy water. Wipe or air dry.

INSPECTION

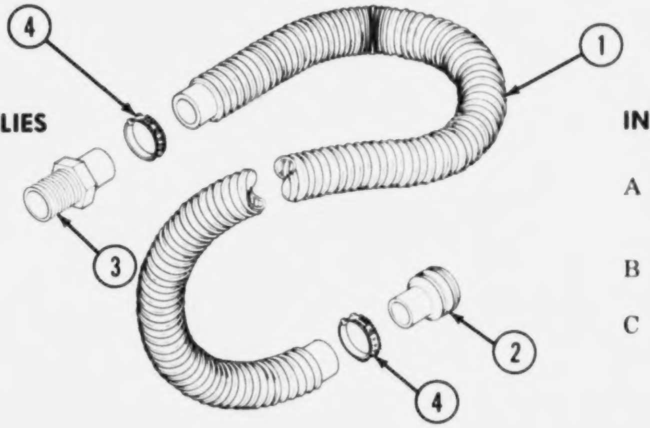
A Inspect hose clamps (1) and coupling halves (4) for damage and wear.

B Inspect hose (2) for damage, deterioration and evidence of dry rot.

TA310682

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

HOSE ASSEMBLIES



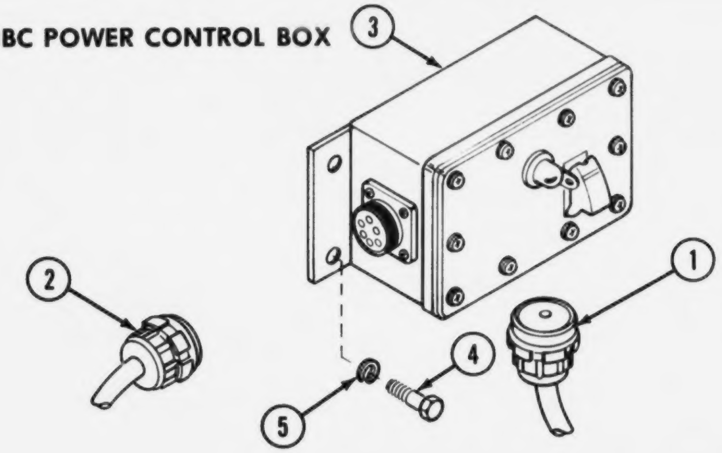
INSTALLATION

A Apply thin coat of adhesive sealant (item 5, Appx D) to inside surface of hose (1) ends.

B Insert coupling half (2) and adapter (3) into ends of hose (1).

C Tighten two clamps (4).

NBC POWER CONTROL BOX



REMOVAL

WARNING

Disconnect battery ground leads before performing maintenance on NBC power control box.

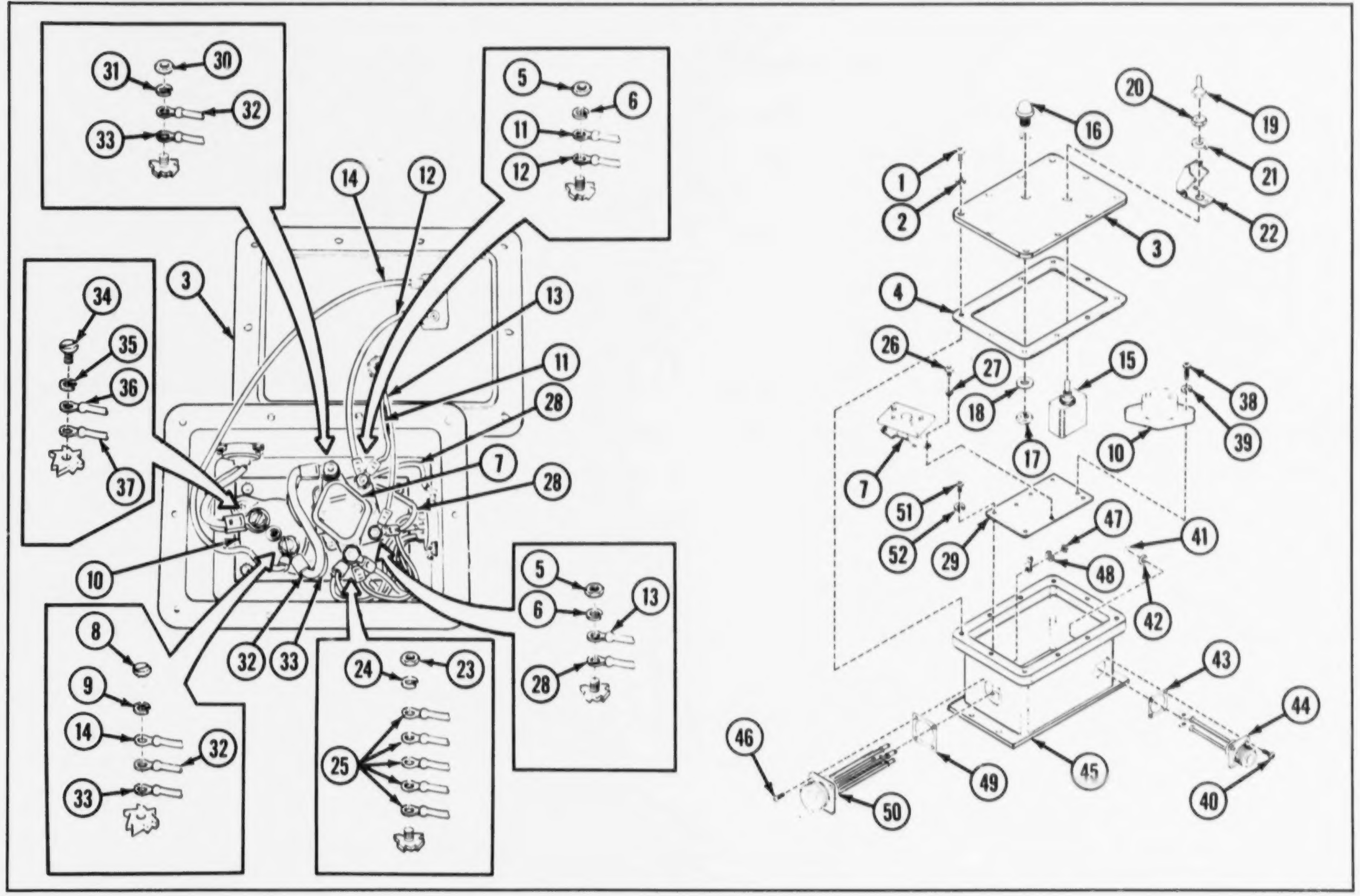
A Remove two plugs (1 and 2) from control box (3).

B Remove four screws (4) and four lockwashers (5).

C Remove control box (3).

TA310683

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)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TA313095

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

DISASSEMBLY

NOTE

Connectors J1, J2 and lamp are removed with soldered wires intact.

A Remove ten screws (1) and ten lockwashers (2) and tilt cover (3) and gasket (4) aside. Discard lockwashers.

NOTE

Tag all wire leads upon removal to ensure proper assembly.

B Remove two nuts (5) and two lockwashers (6) from relay (7) terminals X-1 and X-2 and one hex screw (8) and one lockwasher (9) from circuit breaker (10) terminal B. Discard lockwashers.

C Remove two wires (11 and 12) from relay (7) terminal X-1, one wire (13) from relay (7) terminal X-2 and one wire (14) from circuit breaker (10) terminal B.

D Remove front cover (3) with switch (15) and lamp assembly (16) attached and gasket (4). Discard gasket.

E Remove panel hexnut (17) and washer (18) from rear of cover (3) and remove lamp assembly (16).

F Unscrew boot (19) from switch (15).

G Remove panel hexnut (20), washer (21), switch (15) and guard (22) from cover (3).

H Remove nut (23), lockwasher (24) and five wire leads (25) from relay (7) terminal A2. Discard lockwasher.

I Remove two mounting screws (26), two lockwashers (27), two ground wires (28) and relay (7) from mounting plate (29). Discard lockwashers.

J Remove hexnut (30) and lockwasher (31) from relay (7) terminal A1 and remove two wire leads (32 and 33).

K Remove one hex screw (34), lockwasher (35) and two wire leads (36 and 37) from circuit breaker (10) terminal A. Discard lockwasher.

L Remove two mounting screws (38), two lockwashers (39) and circuit breaker (10) from mounting plate (29). Discard lockwashers.

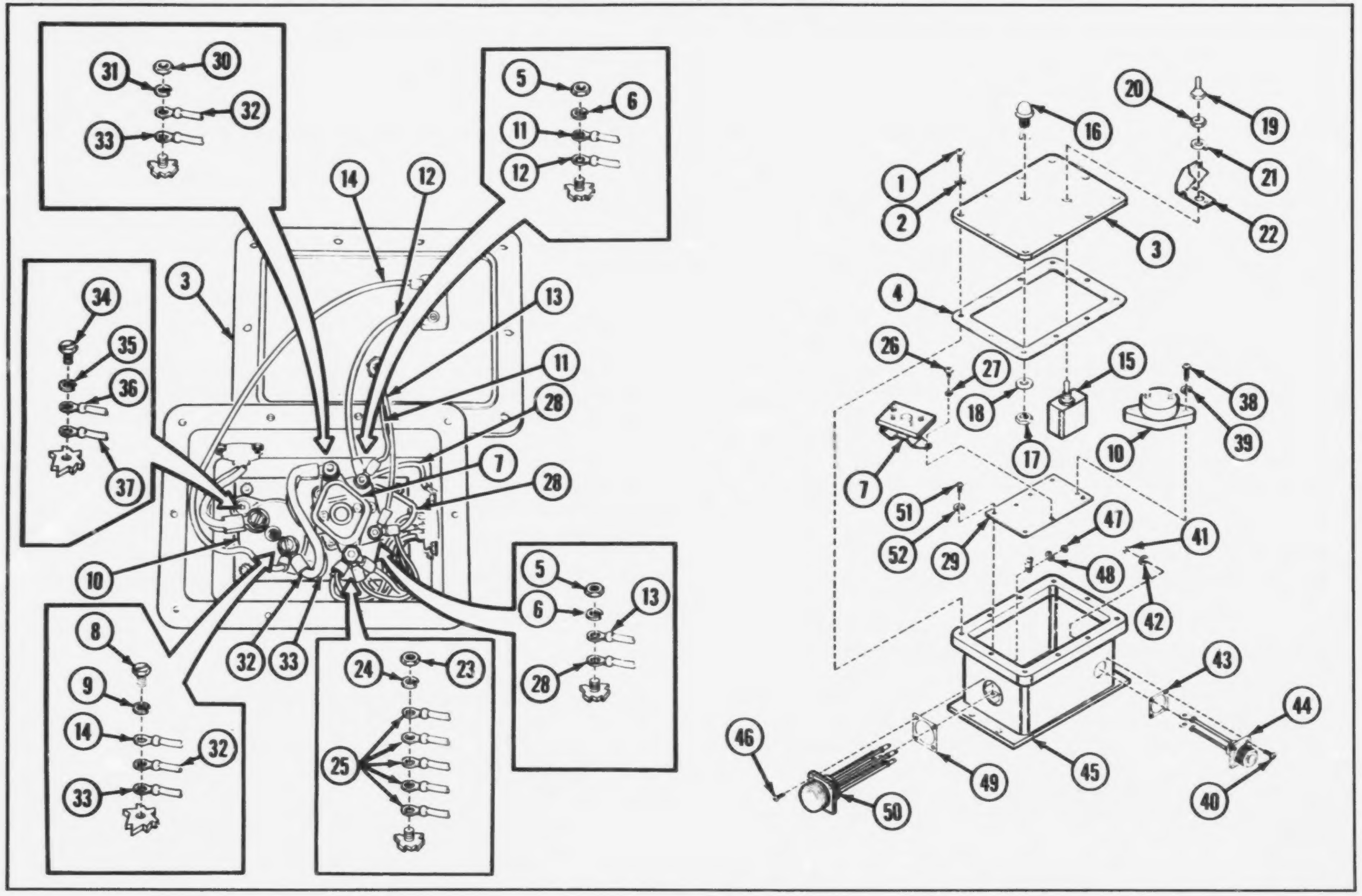
M Remove four screws (40), four nuts (41), four lockwashers (42), gasket (43) and connector J1 (44) from control box body (45). Discard gasket and lockwashers.

N Remove four screws (46), four nuts (47), four lockwashers (48), gasket (49) and connector J2 (50) from control box body (45). Discard gasket and lockwashers.

O Remove four screws (51), four lockwashers (52) and mounting plate (29). Discard lockwashers.

TA313096

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)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TA313097

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

ASSEMBLY

A Install mounting plate (29) with four new lockwashers (52) and four mounting screws (51).

B Install connector J2 (50) and new gasket (49) with four screws (46), four new lockwashers (48) and four nuts (47).

C Install connector J1 (44) and new gasket (43) on control box body (45) with four screws (40), four new lockwashers (42) and four nuts (41).

D Install circuit breaker (10) on mounting plate (29) with two mounting screws (38) and two new lockwashers (39).

E Install relay (7) and two ground wires (28) on mounting plate (29) with two mounting screws (26) and two new lockwashers (27).

F Install two wires (36 and 37) on circuit breaker (10) terminal A with one hex screw (34) and new lockwasher (35).

G Install two wires (32 and 33) on relay (7) terminal A1 and circuit breaker (10) terminal B. Install hexnut (30) and new lockwasher (31) on relay (7) terminal A1.

H Install five wires (25) on relay (7) terminal A2 with hexnut (23) and new lockwasher (24).

I Install switch (15) and guard (22) on front cover (3) with panel hexnut (20) and washer (21).

J Install boot (19) on switch (15).

K Install lamp assembly (16) on front cover (3) with panel hexnut (17) and washer (18).

L Hold front cover (3) and new gasket (4) in a tilted position over control box body (45).

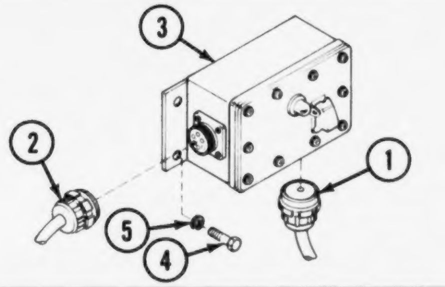
M Connect wire (14) to circuit breaker (10) terminal B and install hex screw (8) and new lockwasher (9).

N Connect two wires (11 and 12) to relay (7) terminal X-1 and wire (13) to relay (7) terminal X-2. Install two hexnuts (5) and two new lockwashers (6).

O Install new gasket (4) and front cover (3) with ten screws (1) and ten new lockwashers (2).

TA313098

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

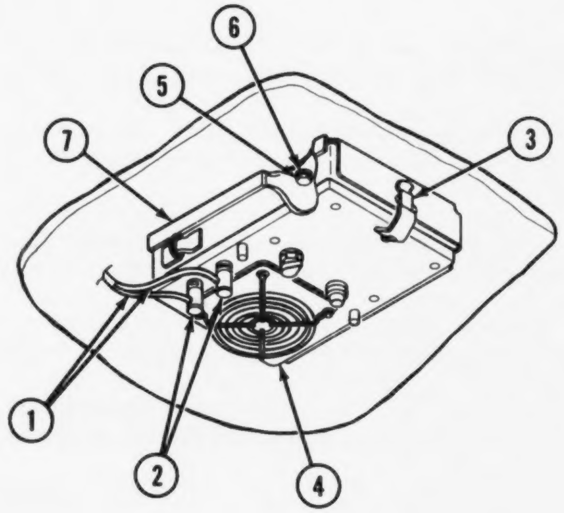


INSTALLATION

A Install control box (3) with four screws (4) and four new lockwashers (5).

B Install two plugs (1 and 2) on control box (3).

M42 ALARM AND MOUNT



WARNING

Disconnect battery ground leads before performing maintenance.

NOTE

Refer to TM 9-6665-225-12 for organizational maintenance instructions on M42 alarm unit.

REMOVAL

A Disconnect two wires (1) from binding posts (2).

B Loosen two latches (3) and remove M42 alarm unit (4).

C Remove four screws (5) and four lockwashers (6).

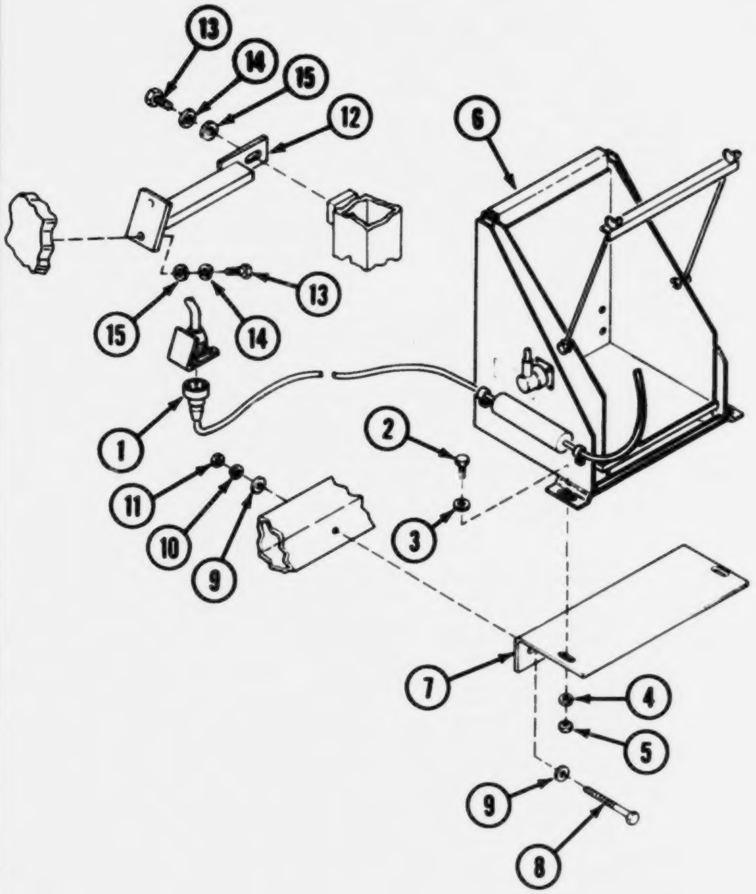
D Remove bracket (7).

INSTALLATION

Reverse order of removal.

TA313099

M43 DETECTOR MOUNT AND BRACKETS (VEHICLES 1 THRU 377)



NOTE

Refer to TM 3-6665-225-12 for organizational maintenance instructions on M43 detector unit.

REMOVAL

A Disconnect connector (1).

B Remove two screws (2), two flat washers (3), two lockwashers (4) and two nuts (5). Discard lockwashers.

C Remove mount (6) from bracket (7).

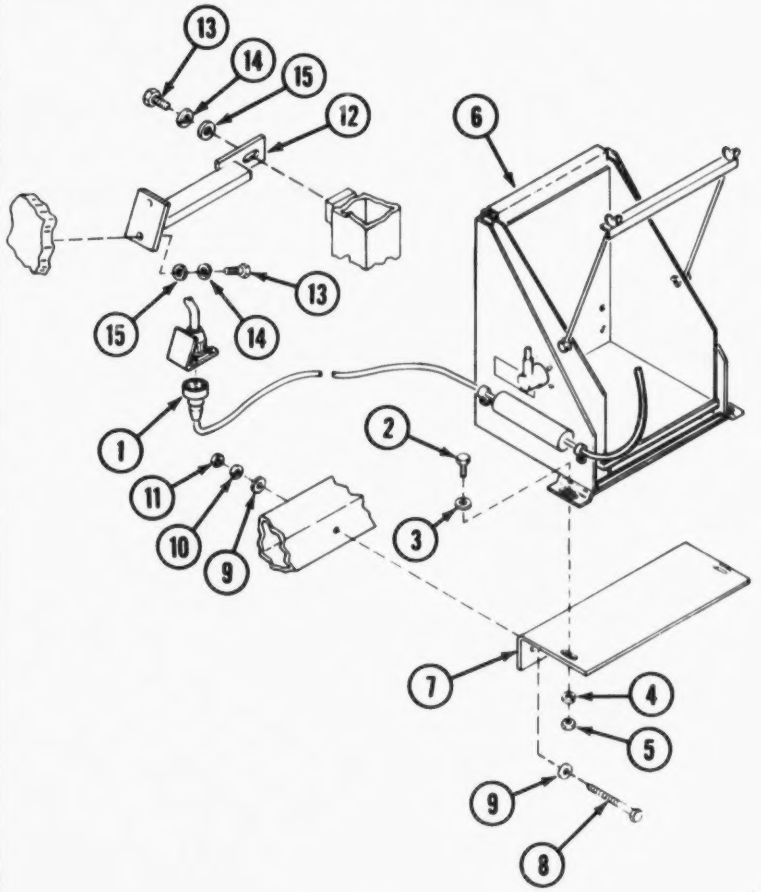
D Remove bracket (7) by removing three screws (8), six flat washers (9), three lockwashers (10) and three nuts (11). Discard lockwashers.

E Remove bracket (12) by removing three screws (13), three lockwashers (14) and three flat washers (15). Discard lockwashers.

TA313100

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

M43 DETECTOR, MOUNT AND BRACKETS (VEHICLES 1 THRU 377)



INSTALLATION

A Install bracket (12) with three screws (13), three new lockwashers (14) and three flat washers (15).

B Install bracket (7) with three screws (8), six flat washers (9), three new lockwashers (10) and three nuts (11).

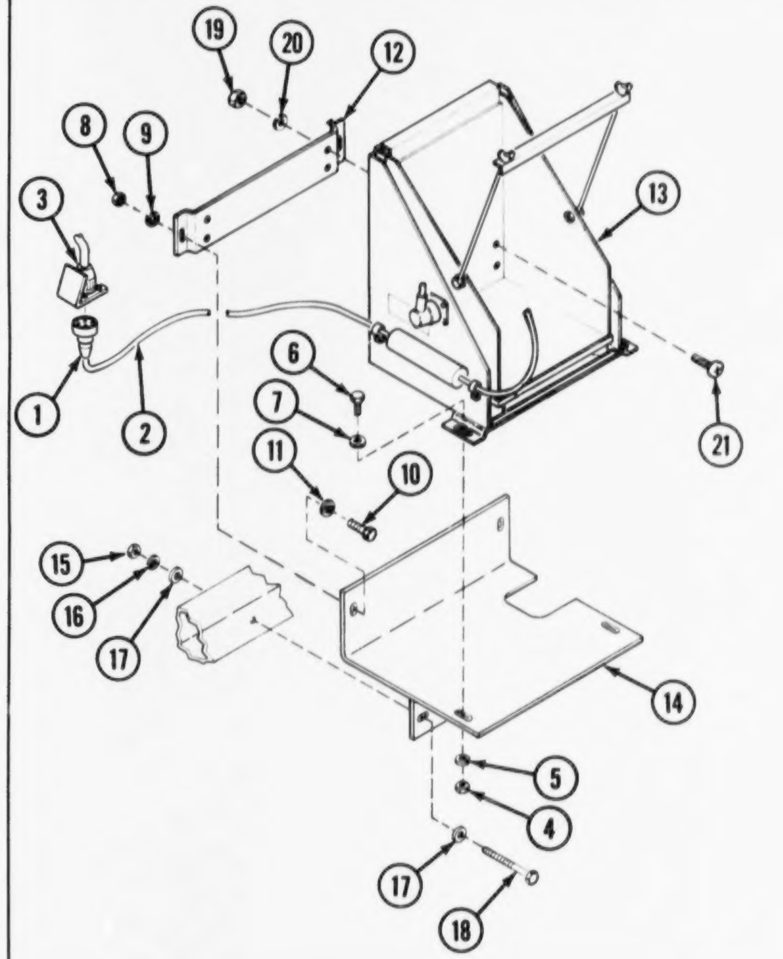
C Install mount (6) on bracket (7) with two screws (2), two flat washers (3), two new lockwashers (4) and two nuts (5).

D Connect connector (1).

TA313101

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

M43 DETECTOR, MOUNT AND BRACKETS (VEHICLES 378 AND UP)



NOTE

Refer to TM 3-6665-225-12 for organizational maintenance instructions on M43 detector unit.

REMOVAL

A Disconnect connector (1) of power cable (2) at wall-mounted bracket (3).

B Remove two nuts (4), two lockwashers (5), two screws (6) and two flat washers (7). Discard lockwashers.

C Remove two nuts (8), two lockwashers (9), two screws (10) and two flat washers (11) from bracket (12) and remove mount (13) and bracket (12) as an assembly. Discard lockwashers.

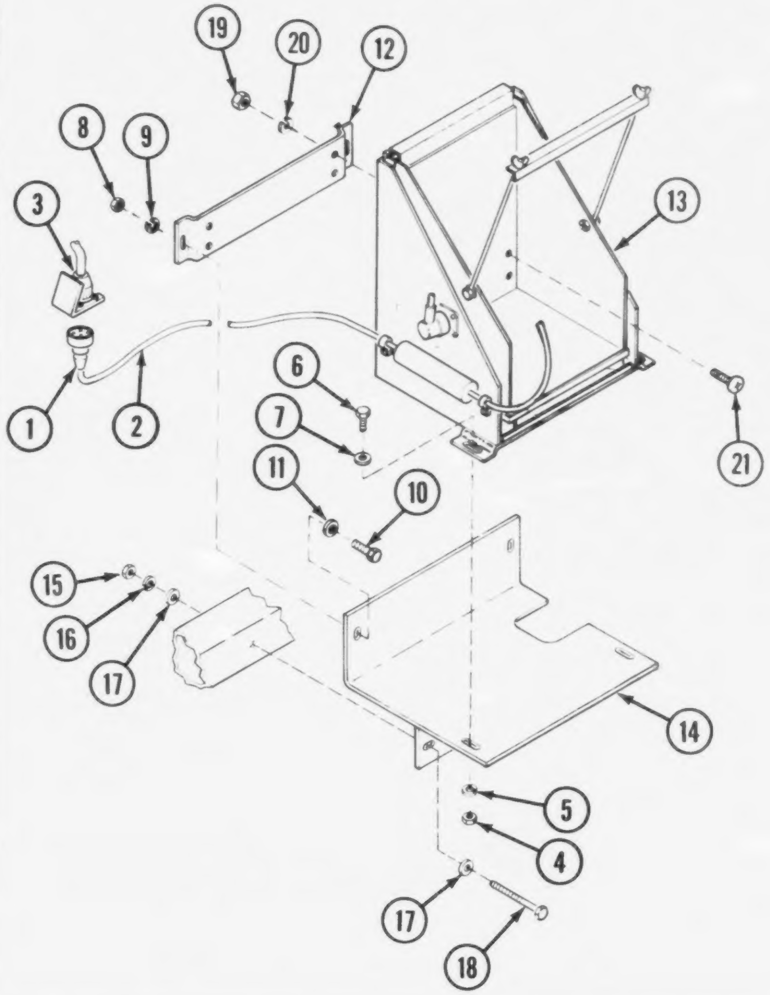
D Remove bracket (14) by removing three nuts (15), three lockwashers (16), six flat washers (17) and three screws (18). Discard lockwashers.

E Remove bracket (12) from mount (13) by removing four nuts (19), four lockwashers (20) and four screws (21). Discard lockwashers.

TA313102

NBC VENTILATED FACE PIECE AND DETECTION/ALARM SYSTEM (CONTINUED)

M43 DETECTOR, MOUNT AND BRACKETS (VEHICLES 378 AND UP)



INSTALLATION

A Install bracket (12) on mount (13) with four screws (21), four new lockwashers (20) and four nuts (19).

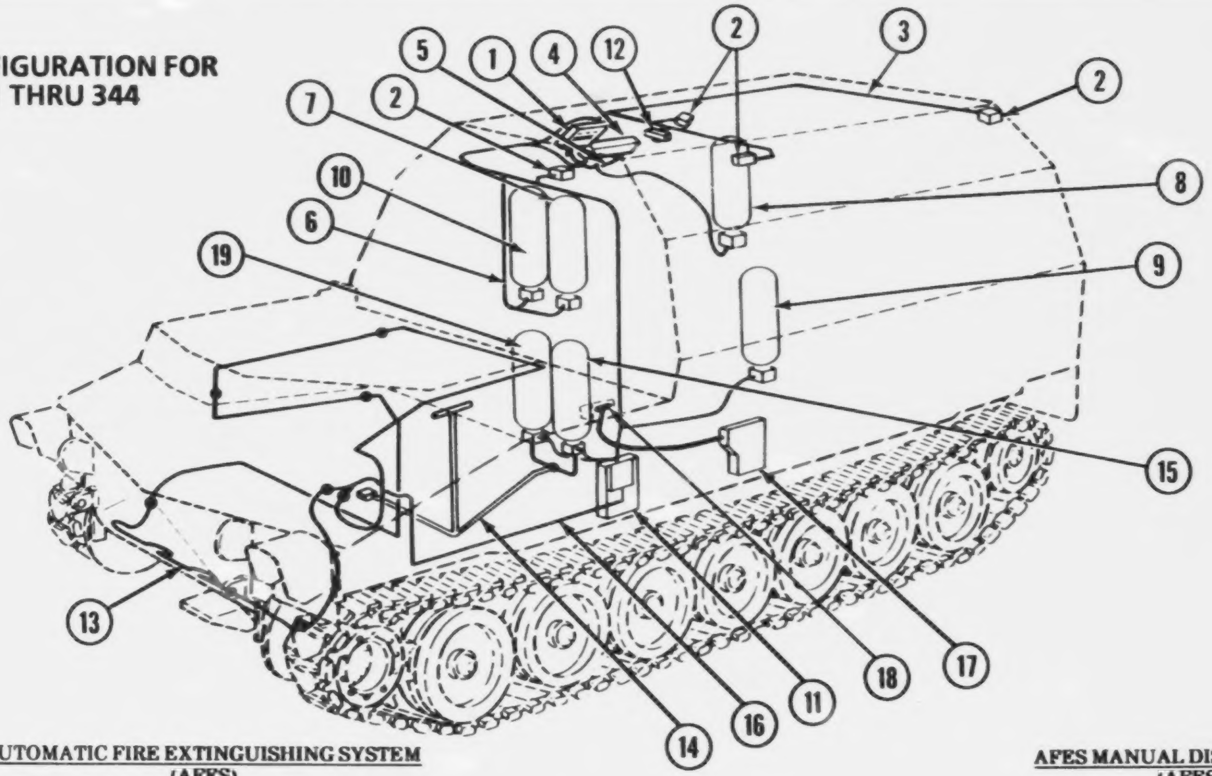
B Install bracket (14) with three screws (18), six flat washers (17), three new lockwashers (16) and three nuts (15).

C Install mount (13) and bracket (12) as an assembly with two screws (10), two flat washers (11), two new lockwashers (9), two nuts (8), two screws (6), two flat washers (7), two new lockwashers (5) and two nuts (4).

D Connect connector (1) of power cable (2) to wall-mounted bracket (3).

Section I: AUTOMATIC FIRE EXTINGUISHER SYSTEM (AFES)

AFES CONFIGURATION FOR VEHICLES 1 THRU 344



AUTOMATIC FIRE EXTINGUISHING SYSTEM (AFES)

CREW

1 Crew T/A Panel
2 OFSA
3 OFSA Wire Harness W1
4 SCEA
5 SCEA Wire Harness W2
6 Extinguisher Wire Harness W3
7 Crew Fire Extinguisher No. 1
8 Crew Fire Extinguisher No. 2
9 Crew Fire Extinguisher No. 3*
10 Crew Fire Extinguisher No. 4*

ENGINE

11 Engine T/A Panel
12 RSI
13 Thermal Detection System
14 Halon Distribution System
15 Engine Fire Extinguisher No. 1
16 Extinguisher Wire Harness W4

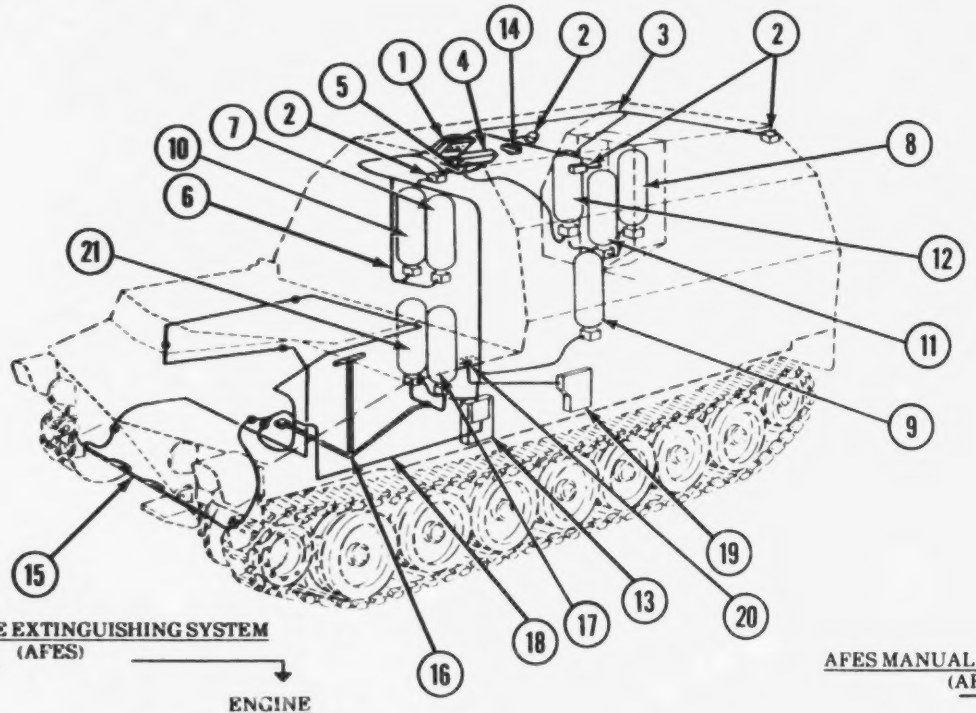
* Activated either by crew AFES or AFES/MDS

AFES MANUAL DISCHARGE SYSTEM (AFES/MDS)

MANUAL

17 Lanyard Assembly
18 Lanyard Cable Pull Handle
19 Engine Fire Extinguisher No. 2

AFES CONFIGURATION FOR VEHICLES 345 AND ABOVE



AUTOMATIC FIRE EXTINGUISHING SYSTEM (AFES)

CREW

1 Crew T/A Panel
2 OFSA
3 OFSA Wire Harness W1
4 SCEA
5 SCEA Wire Harness W2
6 Extinguisher Wire Harness W3
7 Crew Fire Extinguisher No. 1
8 Crew Fire Extinguisher No. 2
9 Crew Fire Extinguisher No. 3*
10 Crew Fire Extinguisher No. 4*
11 Crew Fire Extinguisher No. 5
12 Crew Fire Extinguisher No. 6

ENGINE

13 Engine T/A Panel
14 RSI
15 Thermal Detection System
16 Halon Distribution System
17 Engine Fire Extinguisher No. 1
18 Extinguisher Wire Harness W4

*Activated either by crew AFES or AFES/MDS

AFES MANUAL DISCHARGE SYSTEM (AFES/MDS)

MANUAL

19 Lanyard Assembly
20 Lanyard Cable Pull Handle
21 Engine Fire Extinguisher No. 2

ENGINE AFES DEACTIVATION/REACTIVATION FOR SAFE MAINTENANCE

INITIAL SETUP

Test Equipment/Special Tools:

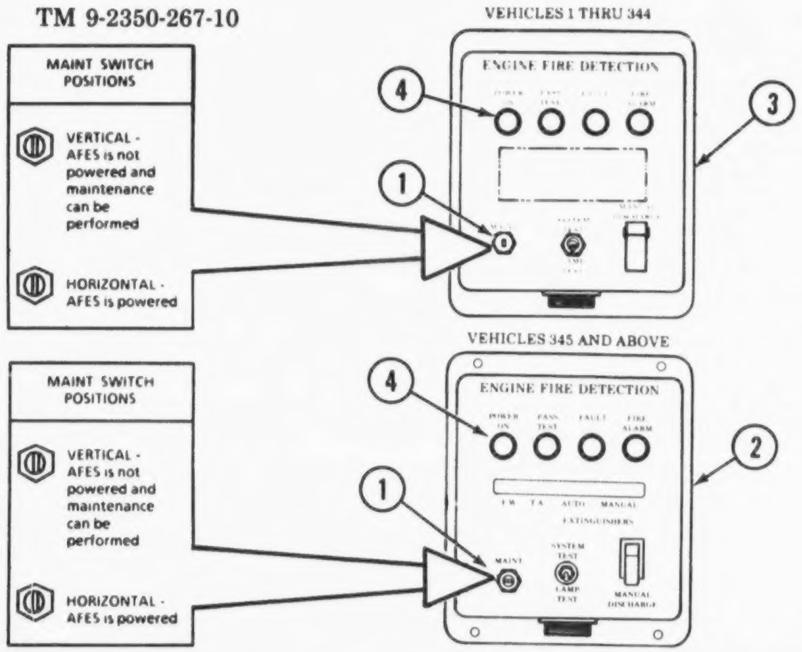
Wrench, adjustable 15" (item 67, Appx B)

Personnel Required:

Two

References:

TM 9-2350-267-10


VEHICLES 1 THRU 344
MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
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VEHICLES 345 AND ABOVE
MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
F.W.
T.A.
AUTO
MANUAL
EXTINGUISHERS
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE
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General Safety Instructions:

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.

DEACTIVATION

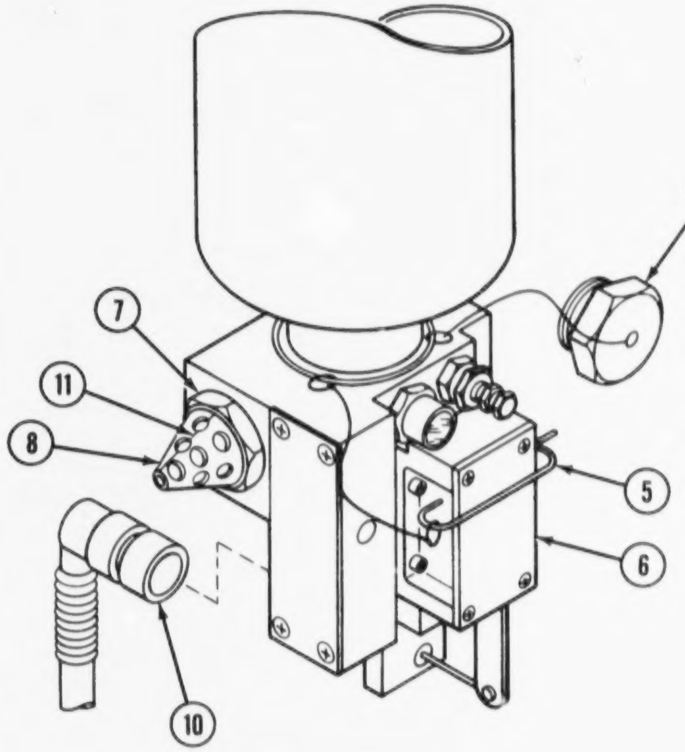
WARNING

AFES is designed to provide 2 to 4 hours of fire protection AFTER vehicle shutdown. Turning MASTER switch OFF does NOT deactivate AFES. Working on AFES when active may cause serious injury to personnel.

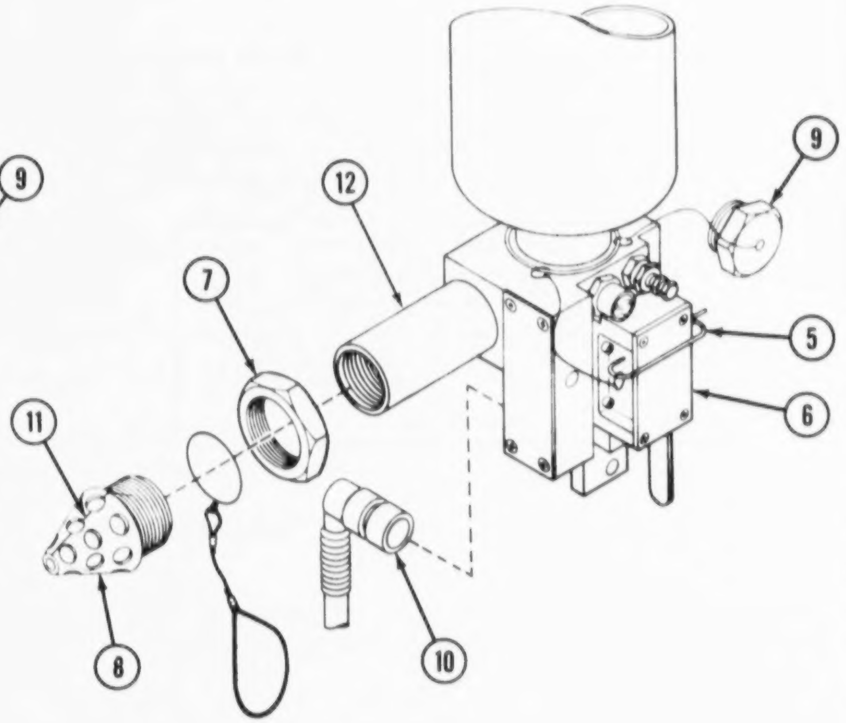
A Turn MAINTenance switch (1) on engine T/A panel (2 or 3) to vertical position. Make sure all lights, including POWER ON light (4), go off.

B Move projectile racks to rear of vehicle (TM 9-2350-267-10).

ENGINE AFES DEACTIVATION/REACTIVATION FOR SAFE MAINTENANCE (CONTINUED)



FOR SIX FIRE
EXTINGUISHERS
INSIDE VEHICLE
(FOUR CREW COMPARTMENT AFES
AND TWO ENGINE AFES)



FOR TWO REAR
BOX CREW
FIRE EXTINGUISHERS
(FOUND ONLY ON VEHICLES 345
AND ABOVE)

ENGINE AFES DEACTIVATION/REACTIVATION FOR SAFE MAINTENANCE (CONTINUED)

C Ensure locking pin (5) in valve actuator guard (6) is installed in both engine cylinder bottles.

REACTIVATION

A Remove locking pin (5) from valve actuator guard (6) of engine cylinder bottle no. 2.

B Turn MASTER switch ON.

C Move MAINTenance switch to horizontal position. Verify successful BITE test. (Step F, p 14-57 for vehicles 1 thru 344 or step F, p 14-60.2 for vehicles 345 and above.)

D Turn MASTER switch OFF.

E Move projectile racks to front of vehicle (TM 9-2350-267-10).

CREW AFES DEACTIVATION/REACTIVATION FOR SAFE MAINTENANCE

INITIAL SETUP

Test Equipment/Special Tools:

Wrench, open-end, 1-1/8 in. (item 71, Appx B)

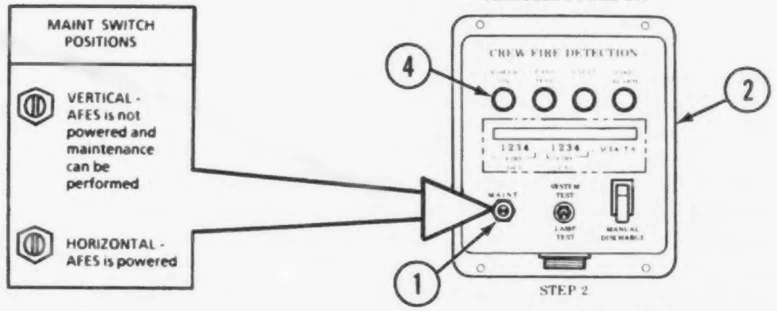
Personnel Required:

Two

References:

TM 9-2350-267-10

VEHICLES 1 THRU 344


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
MAINT
4
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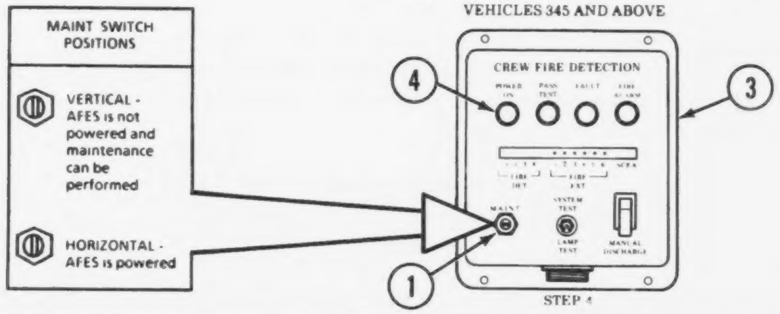
STEP 2

VEHICLES 345 AND ABOVE


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
SYSTEM TEST
LAMP TEST
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1

STEP 4

General Safety Instructions

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.

DEACTIVATION

WARNING

AFES is designed to provide 2 to 4 hours of fire protection AFTER vehicle shutdown. Turning MASTER switch OFF does NOT deactivate AFES. Working on AFES when active may cause serious injury to personnel.

A Turn MAINTenance switch (1) on crew T/A panel (2 or 3) to vertical position. Make sure all lights, including POWER ON light (4), go off.

B Move projectile racks to rear of vehicle (TM 9-2350-267-10).

CREW AFES DEACTIVATION/REACTIVATION FOR SAFE MAINTENANCE (CONTINUED)

NOTE

See p 14-14.4 for illustration for steps C thru F.

C Ensure locking pin (5) is installed in valve actuator guard (6) on four crew compartment cylinder bottles in vehicles 1 thru 344 or on four crew compartment cylinder bottles and two fire extinguishers (located in rear fire extinguisher box assembly) in vehicles 345 and above.

D Loosen nut (7) and unscrew dispersion nozzle (8) from four crew compartment cylinder bottles in vehicles 1 thru 344 or from four crew compartment cylinder bottles and two rear cylinder bottle extenders (12) in vehicles 345 and above.

E Remove four anti-recoil plugs (9) from bulkhead in vehicles 1 thru 344 or four from bulkhead and two from rear extinguisher box assembly in vehicles 345 and above.

CAUTION

Install anti-recoil plugs on each cylinder bottle immediately after removing each nozzle.

F Install and tighten four anti-recoil plugs (9) on four crew compartment cylinder bottles in vehicles 1 thru 344 or on four crew compartment cylinder bottles and two rear cylinder bottle extenders (12) in vehicles 345 and above.

REACTIVATION

NOTE

See p 14-14.4 for illustration for steps A thru F.

A Remove anti-recoil plugs (9) from four crew compartment cylinder bottles in vehicles 1 thru 344 or from four crew compartment cylinder bottles and two rear cylinder bottle extenders (12) in vehicles 345 and above.

B Replace and tighten anti-recoil plugs in holding fixtures located next to four crew cylinder bottles on vehicles 1 thru 344, or next to four crew cylinder bottles and two rear cylinder bottles on vehicles 345 and above.

C Fully screw nut (7) onto nozzle (8). Back off nut (7) no more than one turn. Never fully remove nut from nozzle.

CAUTION

Install nozzles on each cylinder bottle immediately after removing each anti-recoil plug.

D Install and tighten nozzle (8) on four crew compartment cylinder bottles in vehicles 1 thru 344 or four crew compartment cylinder bottles and two rear extinguisher extenders (12) in vehicles 345 and above. Back off nozzle (8) (no more than one turn) until engraved line (11) is in up (vertical) position.

E Tighten nut (7).

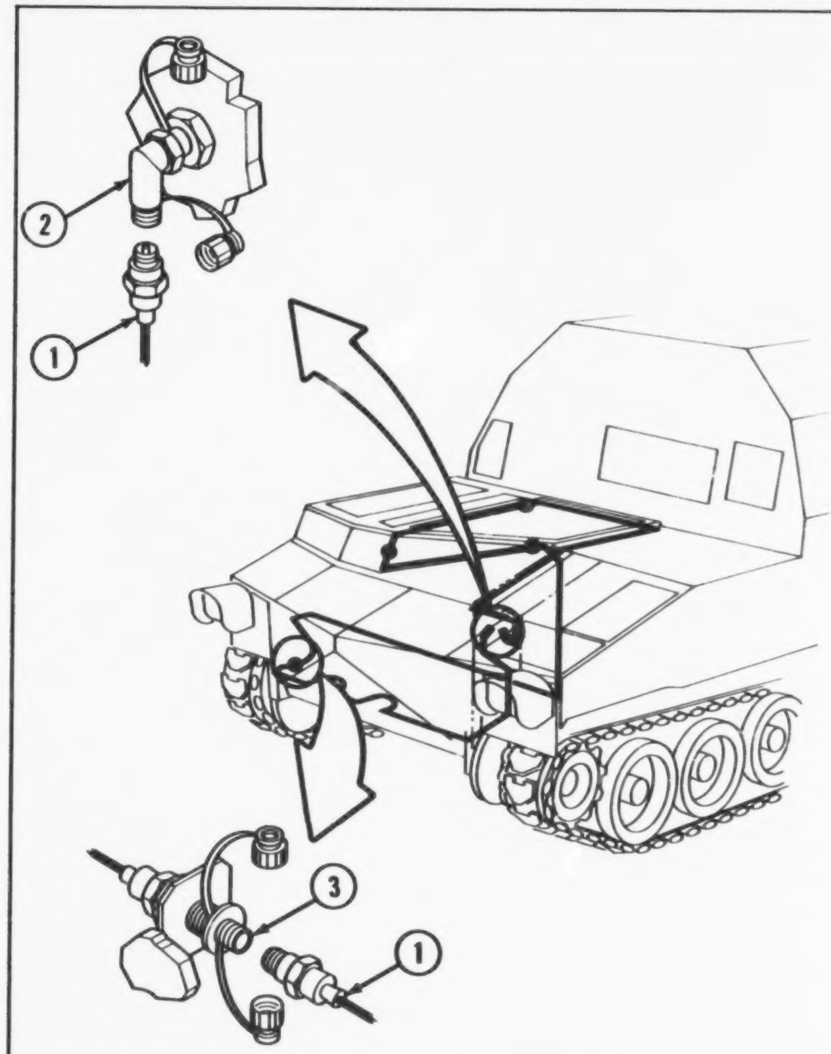
F Remove locking pin (5) from valve actuator guards (6) of crew extinguishers no. 3 and no. 4. Do not remove any other locking pins.

G Turn MASTER switch ON.

H Move MAINTenance switch to horizontal position. Verify successful BITE test (step F, p 14-57 for vehicles 1 thru 344 and step F, p 14-60.2 for vehicles 345 and above).

I Move projectile racks to front of vehicle (TM 9-2350-267-10).

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION



WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

REMOVAL

CAUTION

Failure to disconnect thermal wire before removing powerpack may cause equipment damage.

A Remove powerpack (p 3-1).

B Remove starter relay (p 6-45).

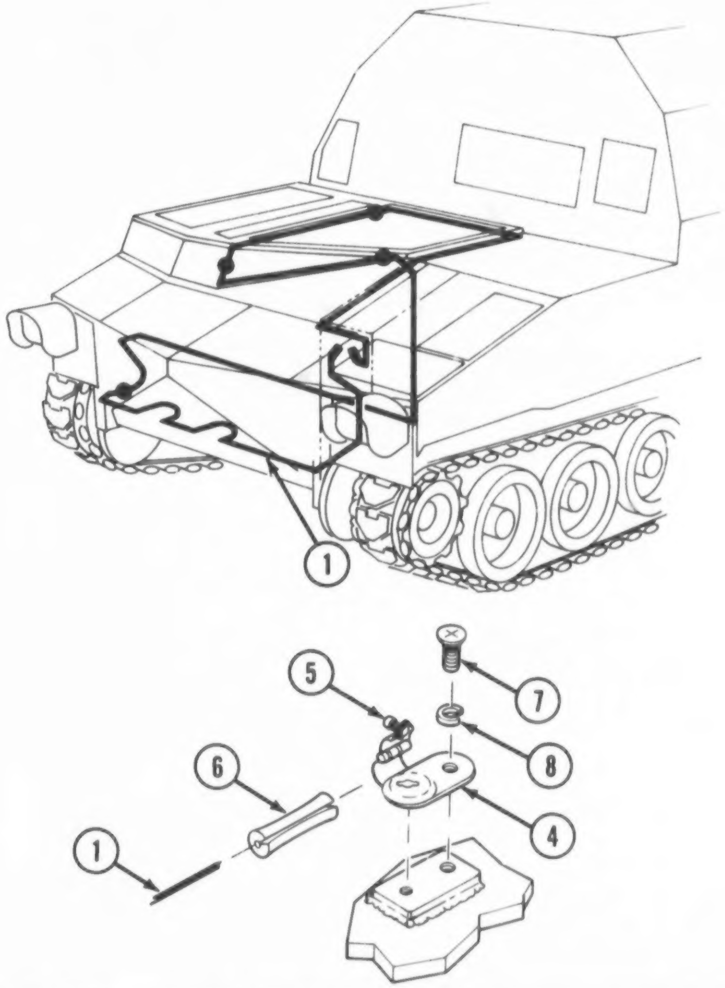
NOTE

Note location and routing of installed sensing element before removal from engine compartment. Install new sensing element in same location, using same routing.

C Disconnect connector of sensing element (1) from bulkhead elbow coupling (2). Cap elbow coupling.

D Disconnect connector of sensing element (1) from straight coupling (3). Cap straight coupling.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)



E To remove sensing element (1) from 24 mounting and clip assemblies (4), release quarter-turn fasteners (5) and open clip assembly. Remove sensing element (1) with attached rubber bushings (6).

F To remove 24 mounting and clip assemblies (4), remove from each: one screw (7) and one lockwasher (8). Discard lockwashers.

INSTALLATION

CAUTION

When hand shaping sensing element for installation, do not damage sensing element by crushing or too much bending (allowable radius - 6 inches minimum). Ensure 1/2-inch to 3/4-inch clearance between sensing element and personnel heater exhaust tube.

A Install 24 rubber bushings (6) spacing equally along length of sensing element (1).

B If removed, install 24 mounting and clip assemblies (4) on 24 engine compartment clip assembly mounts, securing each with one screw (7) and one new lockwasher (8).

C Install sensing element. Shape sensing element (1) by hand to fit in engine compartment. Route sensing element correctly through front portion of engine compartment.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)

D After sensing element is installed, move rubber bushings (6) on sensing element (1) so each will engage one mounting and clip assembly (4).

E Secure sensing element (1) in each mounting and clip assembly (4) by flipping clip over each rubber bushing (6) installed on sensing element (1). Secure clip using quarter-turn fastener (5).

CAUTION

Before installation, clean connector fittings thoroughly with electrical contact cleaner (item 74, Appx D).

F Remove cap from straight coupling. Join connector of sensing element (1) to straight coupling (3) and tighten.

G Remove cap from elbow coupling. Join connector of sensing element (1) to bulkhead elbow coupling (2) and tighten.

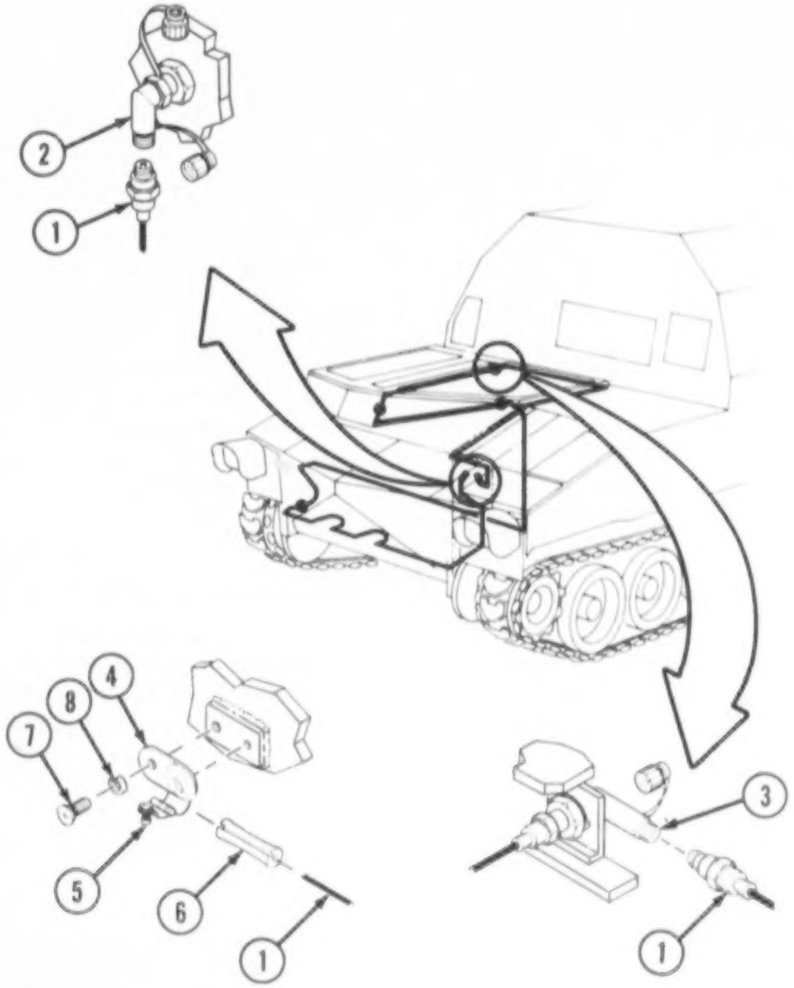
H Install starter relay (p 6-45).

I Install powerpack (p 3-1)

WARNING

Remove locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2 (p 14-28). Turn engine T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON to activate engine AFES.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)



WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

REMOVAL

NOTE

Note location and routing of installed sensing element before removal from engine compartment. Install new sensing element in same location using same routing.

A Open forward battery compartment door and louvered engine access door.

B Disconnect connector of sensing element (1) from bulkhead elbow coupling (2). Cap elbow coupling.

C Disconnect connector of sensing element (1) from elbow coupling (3). Cap elbow coupling.

D To remove sensing element (1) from 24 mounting and clip assemblies (4), release quarter-turn fasteners (5) and open clip assembly. Remove sensing element (1) with attached rubber bushings (6).

E To remove 24 mounting and clip assemblies (4), remove from each: one screw (7) and one lockwasher (8). Discard lockwashers.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

CAUTION

When hand shaping sensing element for installation, do not damage sensing element by crushing or too much bending (allowable radius - 6 inches minimum). Ensure 1/2-inch to 3/4-inch clearance between sensing element and personnel heater exhaust tube.

A Install 24 rubber bushings (6) spacing equally along length of sensing element (1).

B If removed, install 24 mounting and clip assemblies (4) on 24 engine compartment clip assembly mounts, securing each with one screw (7) and one new lockwasher (8).

C Install sensing element. Shape sensing element (1) by hand to fit in engine compartment. Route sensing element correctly through front portion of engine compartment.

D After sensing element is installed, move rubber bushings (6) on sensing element (1) so each will engage one mounting and clip assembly (4).

E Secure sensing element (1) in each mounting and clip assembly (4) by flipping clip over each rubber bushing (6) installed on sensing element (1). Secure clip using quarter-turn fastener (5).

CAUTION

Before installation, clean connector fittings thoroughly with an electrical contact cleaner (item 74, Appx D).

F Remove cap from elbow coupling. Join connector of sensing element (1) to elbow coupling (3) and tighten.

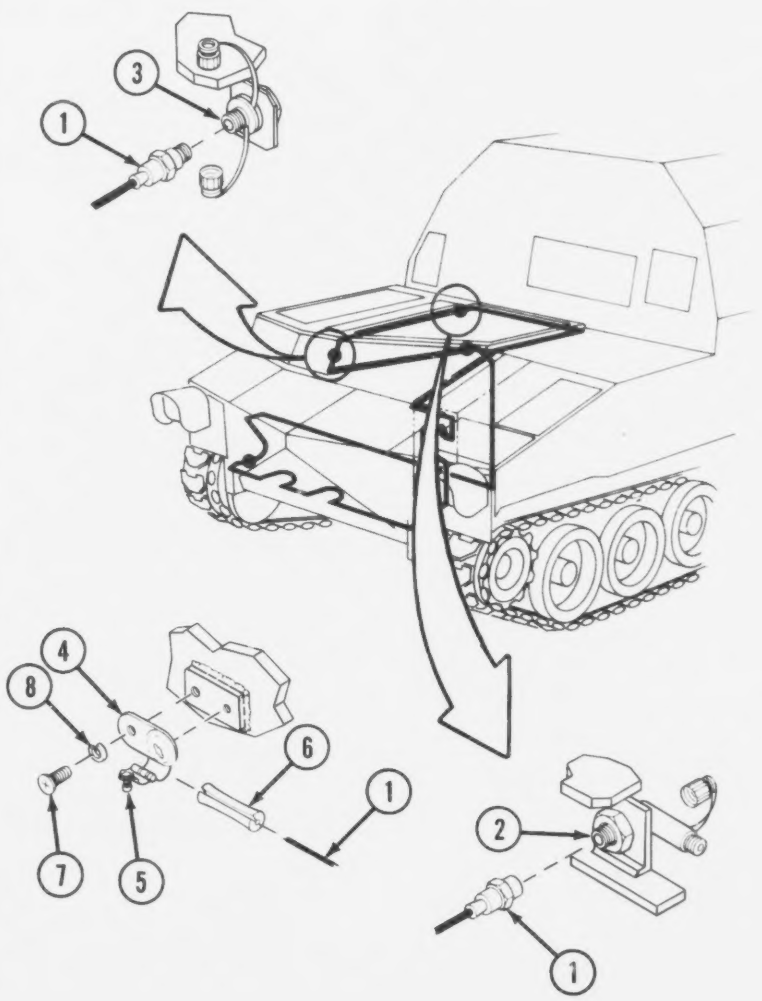
G Remove cap from elbow coupling. Join connector of sensing element (1) to bulkhead elbow coupling (2) and tighten.

H Close battery and louvered engine access doors.

WARNING

Remove locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2 (p 14-28). Turn engine T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON to activate engine AFES.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)



WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

REMOVAL

NOTE

Note location and routing of installed sensing element before removal from engine compartment. Install new sensing element in the same location using same routing.

A Open louvered engine compartment access door.

B Disconnect connector of sensing element (1) from elbow coupling (2). Cap elbow coupling.

C Disconnect connector of sensing element (1) from straight coupling (3). Cap straight coupling.

D To remove sensing element (1) from eight mounting and clip assemblies (4), release quarter-turn fasteners (5) and open clip assembly. Remove sensing element (1) with attached rubber bushings (6).

E To remove eight mounting and clip assemblies (4), remove from each: one screw (7) and one lockwasher (8). Discard lockwashers.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

CAUTION

When hand shaping sensing element for installation, do not damage sensing element by crushing or too much bending (allowable radius - 6-inches minimum). Ensure 1/2-inch to 3/4-inch clearance between sensing element and personnel heater exhaust tube.

A Install eight rubber bushings (6) spacing equally along length of sensing element (1).

B If removed, install eight mounting and clip assemblies (4) on eight engine compartment clip assembly mounts, securing each with one screw (7) and one new lockwasher (8).

C Install sensing element. Hand shape sensing element (1) to fit in engine compartment. Route sensing element correctly through front portion of the engine compartment.

D After sensing element is installed, move rubber bushings (6) on sensing element (1) so each will engage one mounting and clip assembly (4).

E Secure sensing element (1) in each mounting and clip assembly (4) by flipping clip over each rubber bushing (6) installed on sensing element (1). Secure clip using quarter-turn fastener (5).

CAUTION

Before installation, clean connector fittings thoroughly with an electrical contact cleaner (item 74, Appx D).

F Remove cap from straight coupling. Join connector of sensing element (1) to straight coupling (3) and tighten.

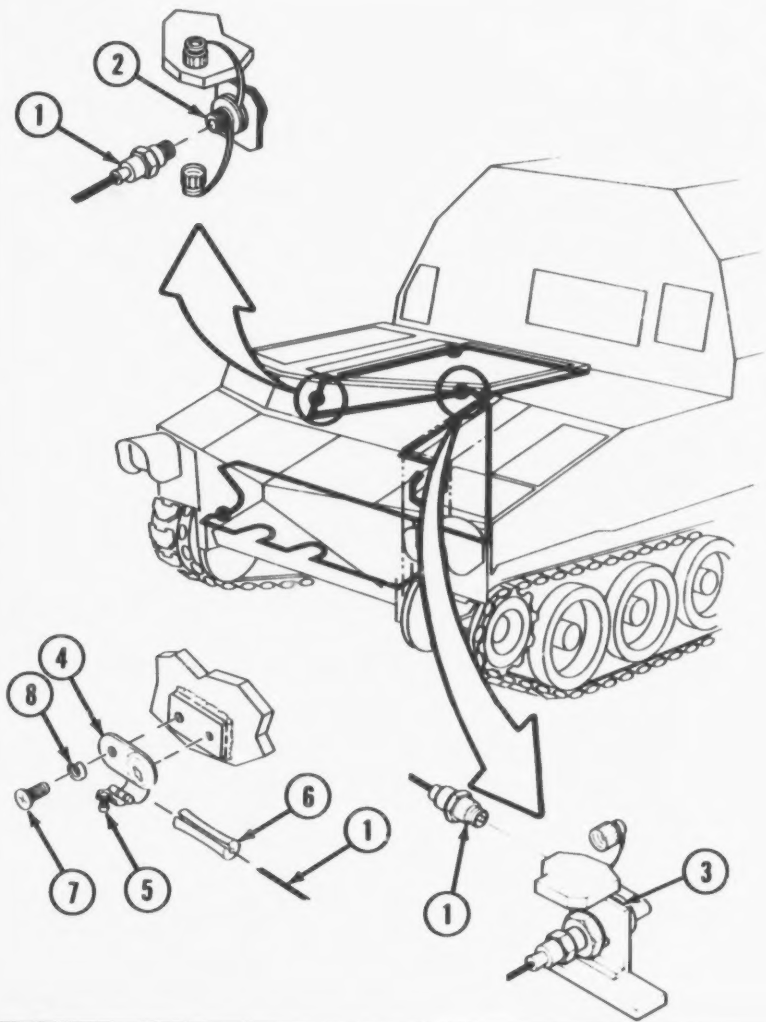
G Remove cap from elbow coupling. Join connector of sensing element (1) to elbow coupling (2) and tighten.

H Close louvered engine access doors.

WARNING

Remove locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2. Turn engine T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON to activate engine AFES.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)



WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

REMOVAL

NOTE

Note location and routing of installed sensing element before removal from engine compartment. Install new sensing element in same location using same routing.

A Open louvered engine compartment access door.

B Disconnect connector of sensing element (1) from straight coupling (2). Cap straight coupling.

C Disconnect connector of sensing element (1) from elbow coupling (3). Cap elbow coupling.

ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)

D To remove sensing element (1) from 10 mounting and clip assemblies (4), release quarter-turn fasteners (5) and open clip assembly. Remove sensing element (1) with attached 10 rubber bushings (6).

E To remove 10 mounting and clip assemblies (4), remove from each: one screw (7) and one lockwasher (8). Discard lockwashers.

INSTALLATION

CAUTION

When hand shaping sensing element for installation, do not damage sensing element by crushing or too much bending (allowable radius - 6-inches minimum). Ensure 1/2-inch to 3/4-inch clearance between sensing element and personnel exhaust tube.

A Install 10 rubber bushings (6) spacing equally along length of sensing element (1).

B If removed, install 10 mounting and clip assemblies (4) on eight engine compartment clip assembly mounts. Secure each with one screw (7) and one new lockwasher (8).

C Install sensing element. Hand shape sensing element (1) to fit in engine compartment. Route sensing element correctly through front portion of engine compartment.

D After sensing element is installed, move rubber bushings (6) on sensing element (1) so each will engage one mounting and clip assembly (4).

E Secure sensing element (1) in each mounting and clip assembly (4) by flipping clip over each rubber bushing (6) installed on sensing element. Secure clip using quarter-turn fastener (5).

CAUTION

Before installation, clean connector fittings thoroughly with an electrical contact cleaner (item 74, Appx D).

F Remove cap from elbow coupling. Join connector of sensing element (1) to elbow coupling (3) and tighten.

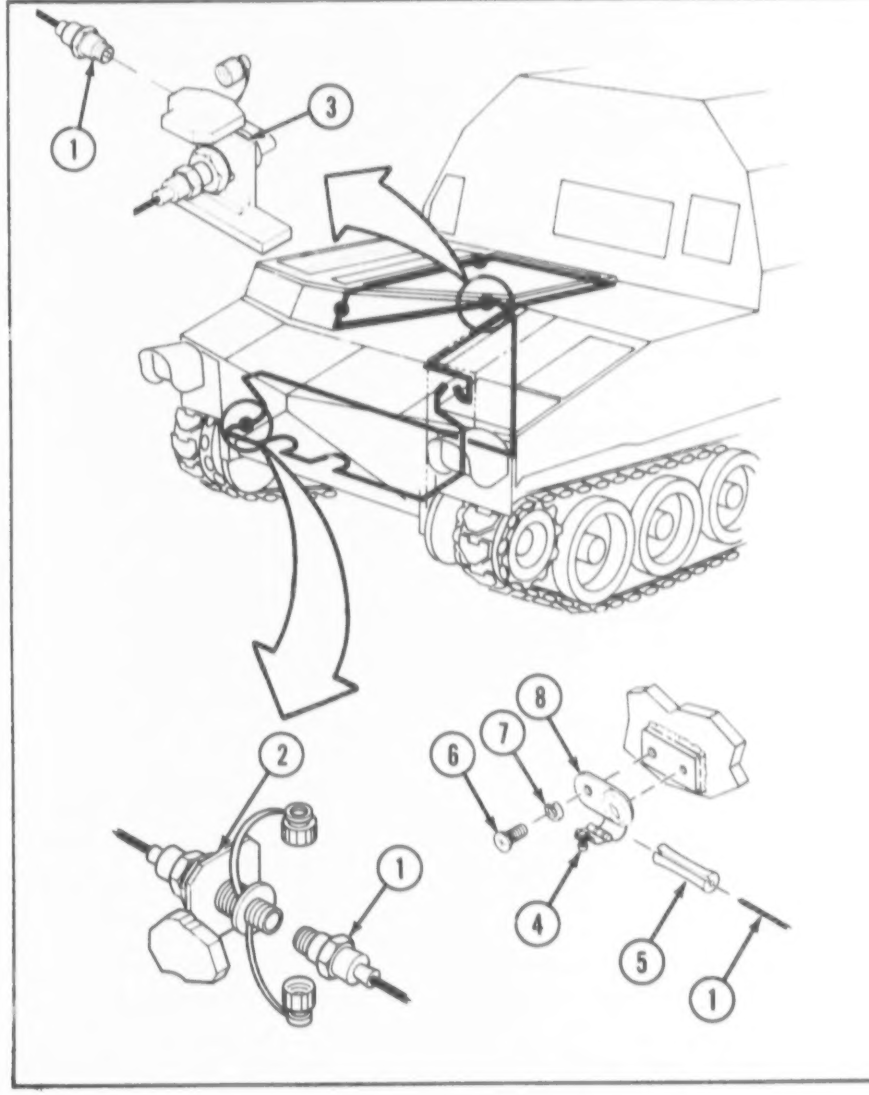
G Remove cap from straight coupling. Join connector of sensing element (1) to straight coupling (2) and tighten.

H Close louvered engine access door.

WARNING

Remove locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2 (p 14-28). Turn engine T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON to activate engine AFES.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)



WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

REMOVAL

NOTE

Note location and routing of installed sensing element before removal from engine compartment. Install new sensing element in same location using same routing.

A Remove powerpack (p 3-1).

B Disconnect connector of sensing element (1) from straight coupling (2). Cap straight coupling.

C Disconnect connector of sensing element (1) from elbow coupling (3). Cap elbow coupling.

D To remove sensing element (1) from 22 mounting and clip assemblies (8), release quarter-turn fasteners (4) and open clip assembly. Remove sensing element (1) with attached rubber bushings (5).

E To remove 22 mounting and clip assemblies (3), remove from each: one screw (6) and one lockwasher (7). Discard lockwashers.

ENGINE AFES - ENGINE COMPARTMENT FIRE SENSING ELEMENTS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

CAUTION

When hand shaping sensing element for installation, do not damage sensing element by crushing or too much bending (allowable radius - 6-inches minimum). Ensure 1/2-inch to 3/4-inch clearance between sensing element and personnel heater exhaust tube.

A Install 22 rubber bushings (5) spacing equally along length of sensing element (1).

B If removed, install 22 mounting and clip assemblies (3) on 22 engine compartment clip assembly mounts, securing each with one screw (6) and one new lockwasher (7).

C Install sensing element. Hand shape sensing element (1) to fit in engine compartment. Route sensing element correctly through front portion of engine compartment.

D After sensing element is installed, move rubber bushings (5) on sensing element (1) so each will engage one mounting and clip assembly (3).

E Secure sensing element (1) in each mounting and clip assembly (3) by flipping clip over each rubber bushing (5) installed on sensing element (1). Secure clip using quarter-turn fastener (4).

CAUTION

Before installation, clean connector fittings thoroughly with an electrical contact cleaner (item 74, Appx D).

F Remove cap from straight coupling. Join connector of sensing element (1) to straight coupling (2) and tighten.

G Remove cap from elbow coupling. Join connector of sensing element (1) to elbow coupling (3) and tighten.

H Install powerpack (p 3-1).

CAUTION

Remove locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2 (p 14-28). Turn engine T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON to activate engine AFES.

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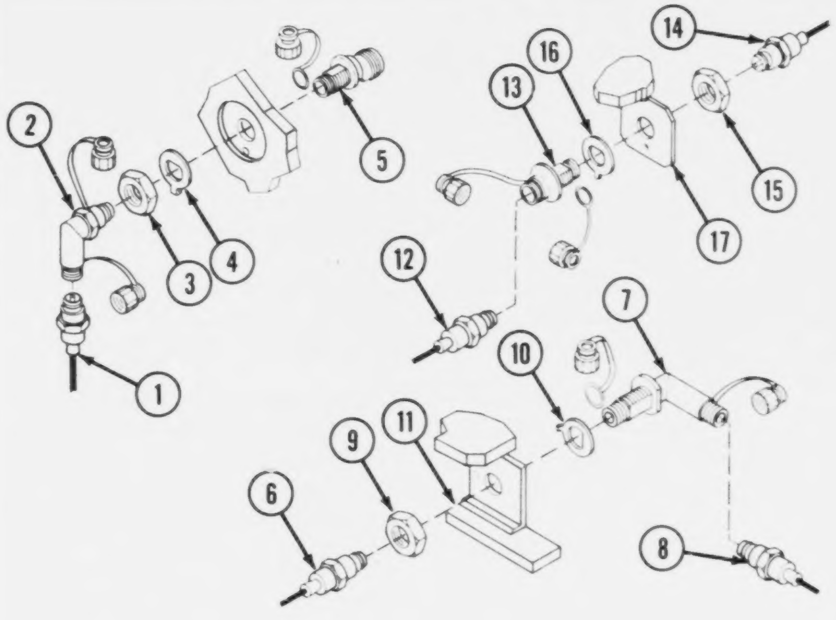
ENGINE AFES - ENGINE COMPARTMENT AFES SENSING ELEMENT COUPLINGS: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

NOTE

When removing bulkhead couplings, remove starter relay (p 6-45) to gain access to coupling.

A Disconnect sensing element (1) from elbow coupling (2). Pull sensing element away from elbow coupling (p 14-15 or 14-18).

B Loosen locknut (3). Remove elbow coupling (2) and flat washer (4) from adapter (5) at bulkhead. Cap both ends of elbow coupling (2).

C Disconnect sensing element (6). Pull sensing element away from elbow coupling (7) (p 14-15, 14-20 or 14-22).

D Disconnect sensing element (8). Pull sensing element (8) away from elbow coupling (7) (p 14-18, 14-20 or 14-24).

E Remove hex nut (9) and remove washer (10). Pull elbow coupling (7) from bracket (11). Cap both ends of elbow coupling (7).

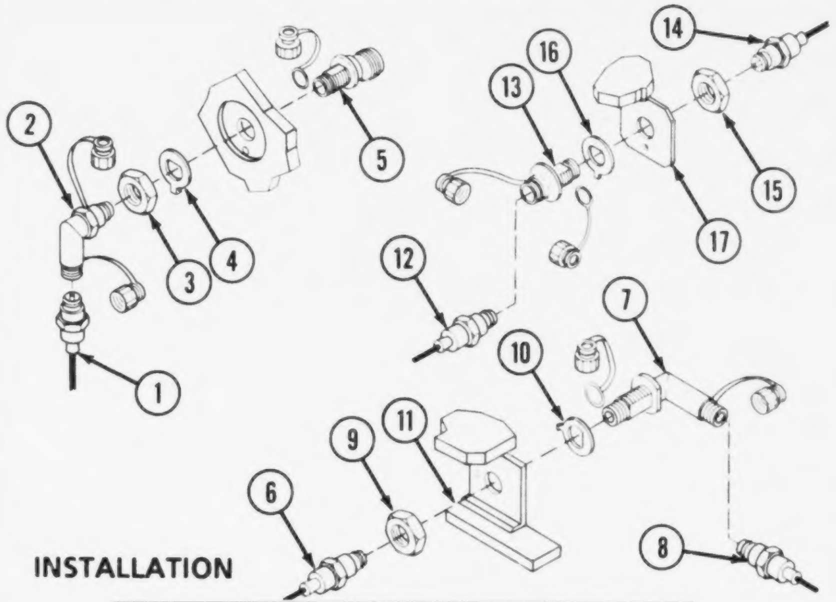
F Disconnect sensing element (12) from straight coupling (13) and pull sensing element (12) away from straight coupling.

G Disconnect sensing element (14) from straight coupling (13) and pull sensing element (14) away from straight coupling.

H Remove locknut (15) and washer (16) from straight coupling (13). Pull straight coupling (13) from bracket (17). Cap both ends of straight coupling (13).

ENGINE COMPARTMENT AFES SENSING ELEMENT COUPLINGS: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION



CAUTION

Before installation, clean connector fittings thoroughly with electrical contact cleaner (item 74, Appx D).

A Remove caps from straight coupling (13). Install straight coupling onto bracket (17) using locknut (15) and washer (16).

B Join sensing element (14) to straight coupling (13) and tighten.

C Join sensing element (12) to straight coupling (13) and tighten.

D Remove caps from elbow coupling (7). Install elbow coupling onto bracket (11) using hex nut (9) and washer (10).

E Join sensing element (8) to elbow coupling (7) and tighten (p 14-15, 14-20 or 14-24).

F Join sensing element (6) to elbow coupling (7) and tighten (p 14-15, 14-20 or 14-24).

G Remove caps from elbow coupling (2). Install elbow coupling (2) onto bulkhead adapter (5) using locknut (3) and washer (4).

H Join sensing element (1) to elbow coupling (2) and tighten (p 14-15 or 14-18).

WARNING

Remove locking pin from valve actuator guard of engine extinguisher cylinder bottle no. 2 (7, p 14-28). Turn engine T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON to activate engine AFES.

ENGINE AFES SENSING ELEMENT DISCONNECT POINTS FOR ENGINE DECK REMOVAL: DISCONNECT AND RECONNECT

DISCONNECT

WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

A Disconnect sensing element (1) from elbow coupling (2). Pull sensing element away from elbow coupling. Cap elbow coupling (2).

B Disconnect sensing element (3) from straight coupling (4). Pull sensing element away from straight coupling. Cap straight coupling (4).

C Disconnect sensing element (5) from elbow coupling (6). Pull sensing element away for elbow coupling. Cap elbow coupling (6).

RECONNECT

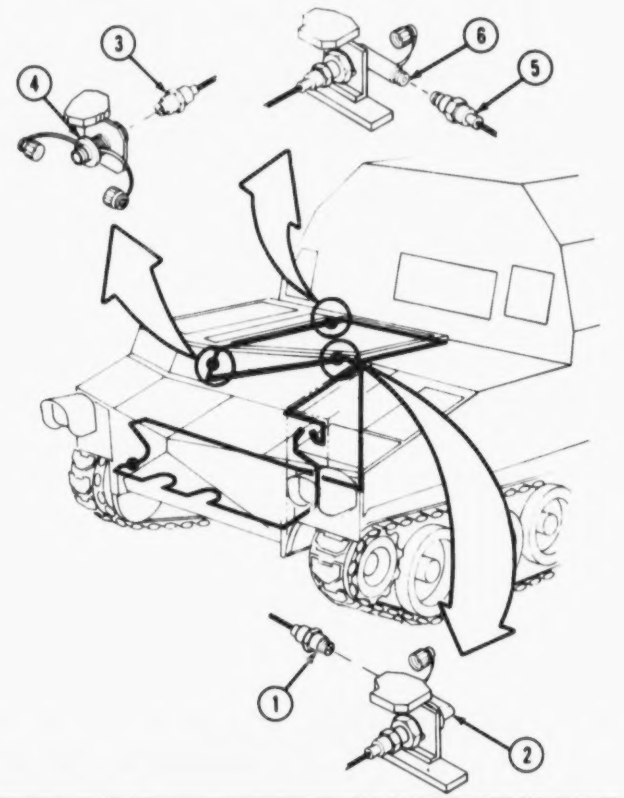
CAUTION

Before installation, clean connector fittings thoroughly with an electrical contact cleaner (item 74, Appx D).

A Remove cap from elbow coupling (6). Connect sensing element (5) to elbow coupling (6) and tighten.

B Remove cap from straight coupling (4). Connect sensing element (3) to straight coupling (4) and tighten.

C Remove cap from elbow coupling (2). Connect sensing element (1) in elbow coupling (2) and tighten. Remove locking pin (15) (p 14-28.1) from valve actuator guard of engine extinguisher cylinder bottle no. 2. Turn engine T/A panel MAINTenance switch to horizontal position.



ENGINE AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 1 THRU 344)

INITIAL SETUP

Equipment Condition:

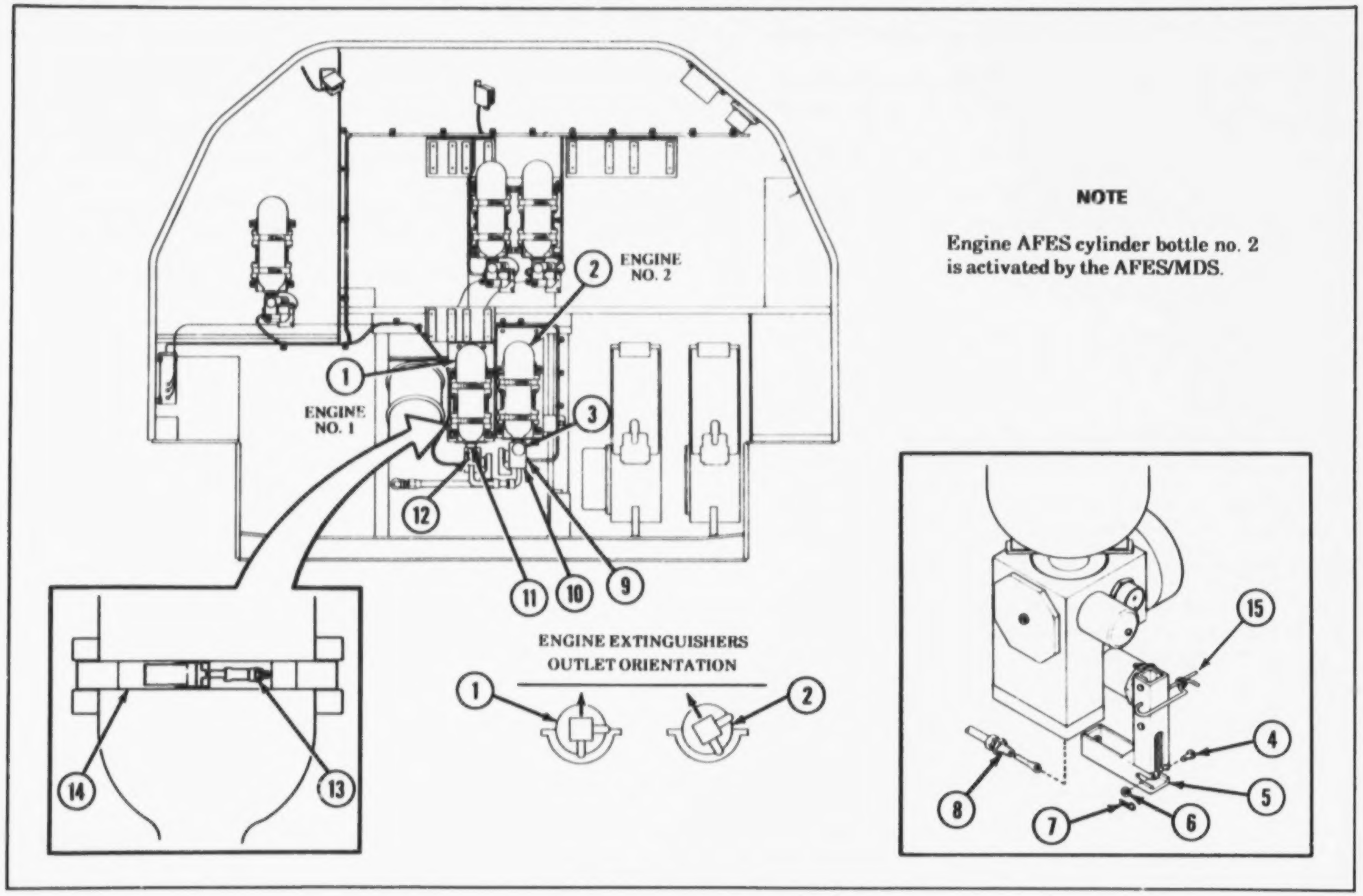
Engine AFES deactivated (p 14-14.3).

General Safety Instructions:

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.

■ ENGINE AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 1 THRU 344) (CONTINUED)


ENGINE NO. 2
2
1
ENGINE NO. 1
3
12
11
10
9
ENGINE EXTINGUISHERS OUTLET ORIENTATION
1
2
14
13
15
4
5
8
7
6

NOTE

Engine AFES cylinder bottle no. 2 is activated by the AFES/MDS.

ENGINE AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 1 THRU 344) (CONTINUED)

REMOVAL

A Deactivate engine AFES (p 14-14.3).

WARNING

Install locking pin (15) in valve actuator guard of engine extinguisher cylinder bottle no. 2 and make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 before attempting to remove cylinder bottle assemblies.

B Disconnect elbows (10 and 12) and plug adapters (3 and 11) from discharge ports of engine compartment cylinder bottle assemblies (1 and 2).

C Install anti-recoil plugs (9) in discharge port of cylinder bottle assemblies (1 and 2).

D Loosen cable at actuator assembly (p 14-52.20), then remove cotter pin (7), pin (4) and washer (6) to disconnect cable assembly (8) from manual valve actuator of engine cylinder bottle assembly no. 2 (2). Discard cotter pin.

E Disconnect and remove cable assembly (8) from manual valve actuator guard (5) of cylinder bottle assembly no. 2 (2).

F Loosen two hex nuts (13) and release strap (14) to remove each cylinder bottle assembly (1 and 2) from its bracket.

G Disconnect electrical cable from bottle assembly.

INSTALLATION

WARNING

Push up red valve flow indicator before installing extinguisher cylinder bottles in correct position. Failure to reset valve may discharge extinguishers and incorrect position may render extinguishers useless in putting out engine compartment fires, causing serious injury to personnel and equipment.

A Install each cylinder bottle assembly (1 and 2) in its bracket and secure by tightening two hex nuts (13) on straps (14).

B Install and connect cable assembly (8) to manual valve actuator guard (5) of engine cylinder bottle assembly no. 2 (2).

C Connect cable assembly (8) to manual valve actuator guard of cylinder bottle assembly no. 2 (2) with washer (6), pin (4) and new cotter pin (7).

D Readjust cable at actuator assembly (p 14-55).

E Remove anti-recoil plugs (9) from discharge port of cylinder bottle assemblies (1 and 2).

F Connect elbows (10 and 12) and plug adapters (3 and 11) to discharge ports of engine compartment cylinder bottle assemblies (1 and 2). Remove locking pin (15) from valve actuator guard of engine extinguisher cylinder bottle no. 2.

G Reactivate engine AFES (p 14-14.5).

CREW AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 1 THRU 344)

INITIAL SETUP

Equipment Condition:

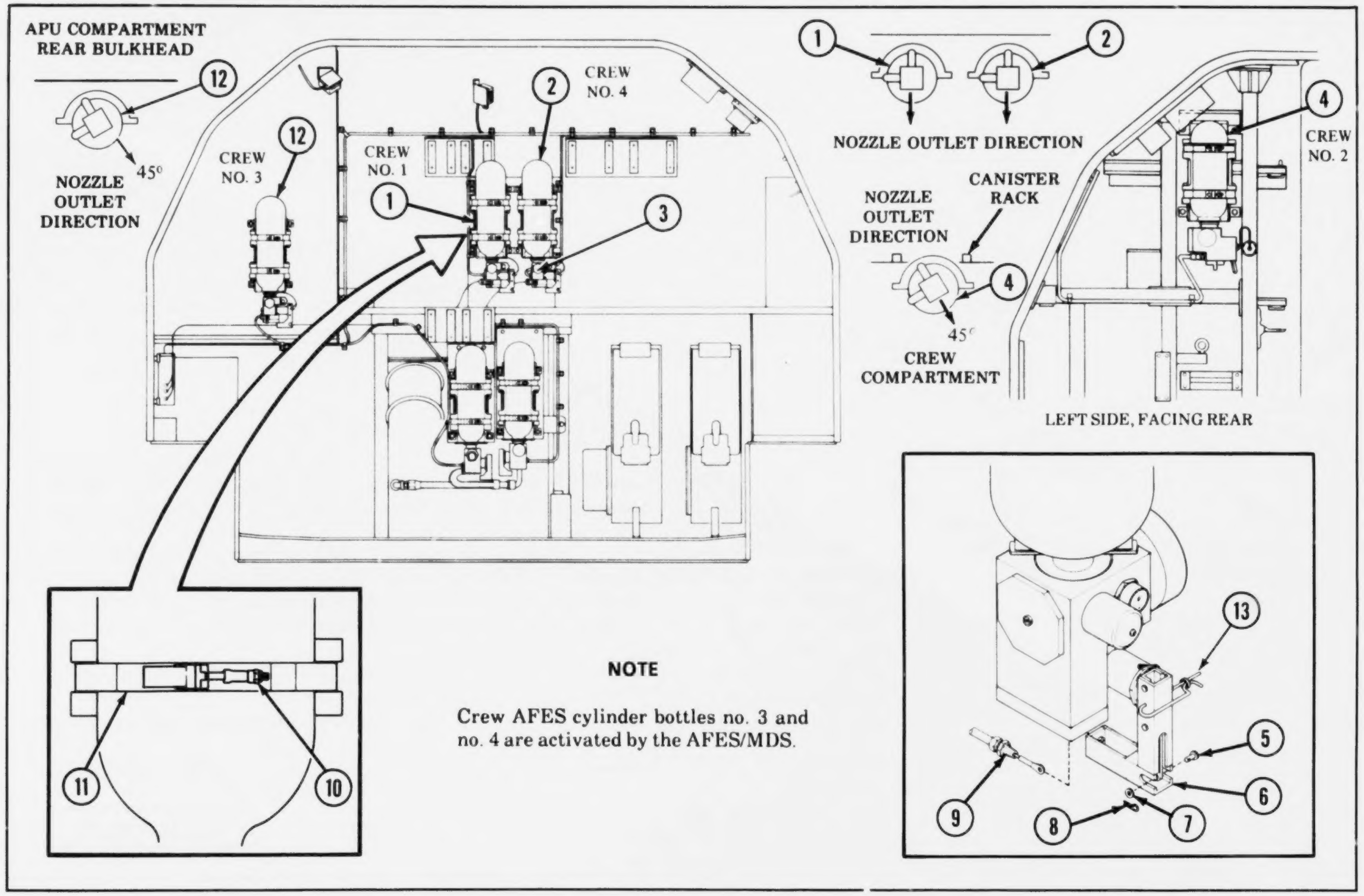
Crew AFES deactivated (p 14-14.7).

General Safety Instructions:

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.

CREW AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 1 THRU 344) (CONTINUED)


APU COMPARTMENT REAR BULKHEAD
12
45°
NOZZLE OUTLET DIRECTION
12
CREW NO. 3
CREW NO. 1
1
2
CREW NO. 4
3
11
10
1
2
NOZZLE OUTLET DIRECTION
CANISTER RACK
NOZZLE OUTLET DIRECTION
4
45°
CREW COMPARTMENT
4
CREW NO. 2
LEFT SIDE, FACING REAR
13
5
6
7
8
9

NOTE

Crew AFES cylinder bottles no. 3 and no. 4 are activated by the AFES/MDS.

CREW AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 1 THRU 344) (CONTINUED)

REMOVAL

A Deactivate crew AFES (p 14-14.7).

> **WARNING**
>
> Install locking pin (13) in valve actuator guards of crew extinguisher cylinder bottles no. 3 and no. 4 and make sure locking pins are installed in valve actuator guards of crew extinguisher cylinder bottles no. 1 and no. 2 before attempting to remove bottle assemblies.

B Install anti-recoil plugs (3) in discharge port of cylinder bottle assemblies (1, 2, 4 and 12).

C Loosen cable at actuator assembly (p 14-52.20), then remove cotter pin (8) pin (5) and washer (7) to disconnect cable assembly (9) from manual valve actuator guards (6) of crew cylinder bottle assemblies no. 3 and no. 4 (2 and 12). Discard cotter pin.

D Disconnect and remove cable assembly (9) from manual valve actuator guards (6) of cylinder bottle assemblies no. 3 and no. 4 (2 and 12).

E Loosen two hex nuts (10) and release straps (11) to remove each cylinder bottle assembly (1, 2, 4 and 12) from its bracket.

F Disconnect electrical cable from cylinder bottle assembly.

INSTALLATION

> **WARNING**
>
> Push up red valve flow indicator before installing extinguisher cylinder bottles in correct position. Failure to reset valve may discharge extinguishers and incorrect position may render extinguishers useless in putting out engine compartment fires, causing serious injury to personnel and equipment.

A Install each cylinder bottle assembly (1, 2, 4 and 12) in its bracket and secure by tightening two hex nuts (10) on straps (11).

B Install and connect cable assembly (9) to manual valve actuator guards (6) of crew cylinder bottle assemblies no. 3 and no. 4 (2 and 12).

C Connect cable assembly (9) to manual valve actuator of cylinder bottle assemblies no. 3 and no. 4 (2 and 12) with washer (7), pin (5) and new cotter pin (8).

D Readjust cable at actuator assembly (p 14-55).

E Remove anti-recoil plugs (3) from discharge port of cylinder bottle assemblies (1, 2, 4 and 12). Remove locking pin (13) from valve actuator guards of crew extinguisher cylinder bottles no. 3 and no. 4 (2 and 12).

F Reactivate crew AFES (p 14-14.8).

ENGINE AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 345 AND ABOVE)

INITIAL SETUP

Equipment Condition:

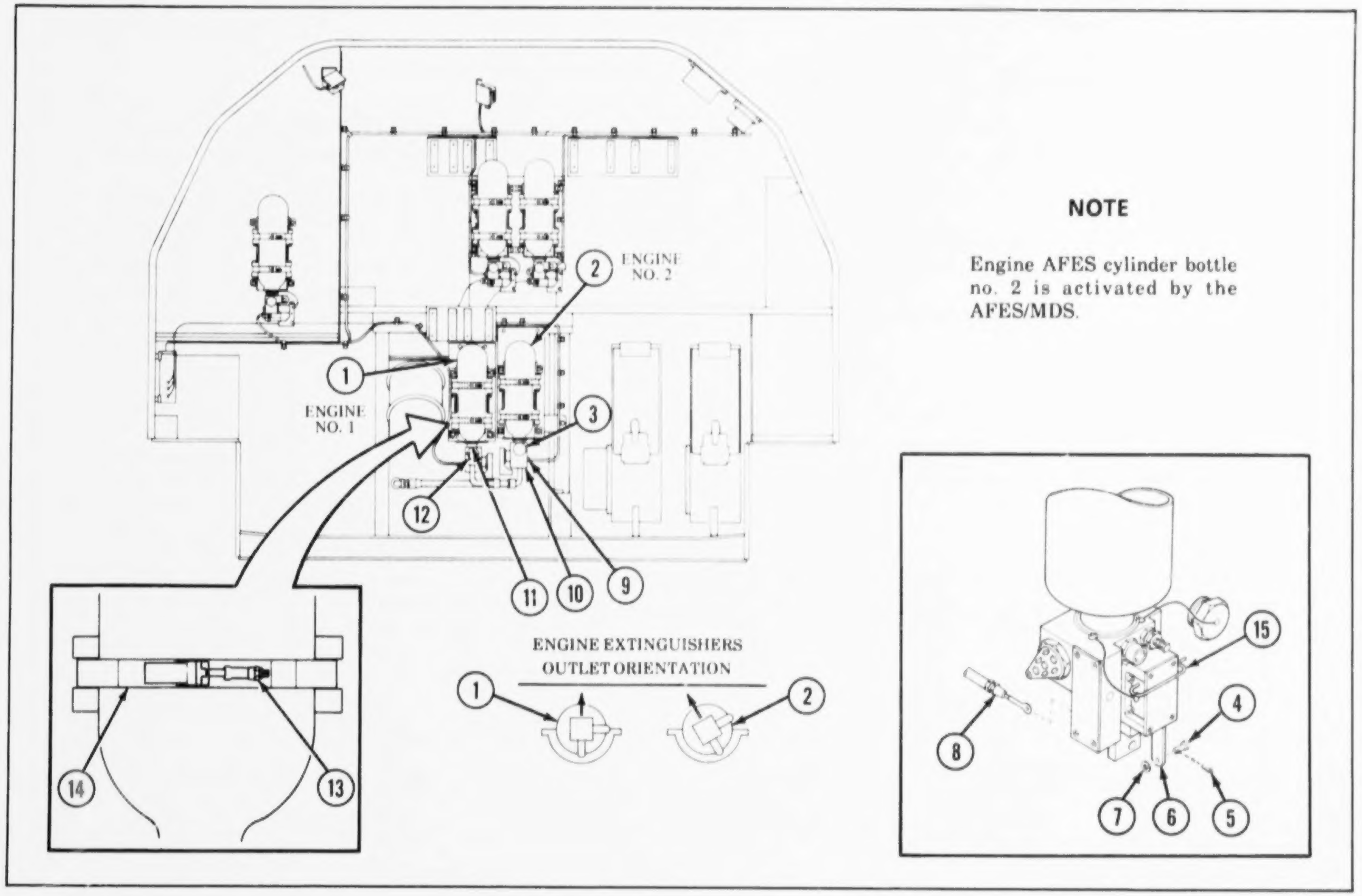
Engine AFES deactivated (p 14-14.3).

General Safety Instructions:

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.

ENGINE AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 345 AND ABOVE) (CONTINUED)


ENGINE NO. 2
ENGINE NO. 1
1
2
3
9
10
11
12
13
14
ENGINE EXTINGUISHERS OUTLET ORIENTATION
1
2
15
4
8
7
6
5

NOTE

Engine AFES cylinder bottle no. 2 is activated by the AFES/MDS.

ENGINE AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 345 AND ABOVE) (CONTINUED)

REMOVAL

A Deactivate engine AFES (p 14-14.3).

WARNING

Install locking pin (15) in valve actuator guard of engine extinguisher cylinder bottle no. 2 and make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 before attempting to remove cylinder bottle assemblies.

B Disconnect elbows (10 and 12) and plug adapters (3 and 11) from discharge ports of engine compartment cylinder bottle assemblies (1 and 2).

C Install anti-recoil plug (9) in discharge port of cylinder bottle assemblies (1 and 2).

D Loosen cable at actuator assembly (p 14-52.20), then remove cotter pin (5), pin (4) and washer (7) to disconnect cable assembly (8) from manual valve actuator of engine cylinder bottle assembly no. 2 (2). Discard cotter pin.

E Disconnect and remove cable assembly (8) from manual valve actuator guard (6) of cylinder bottle assembly no. 2 (2).

F Loosen two hex nuts (13) and release strap (14) to remove each cylinder bottle assembly (1 and 2) from its bracket.

INSTALLATION

WARNING

Install extinguisher cylinder bottles in correct position. Failure to do so may render extinguishers useless in putting out engine compartment fires, causing serious injury to personnel and equipment.

A Install each cylinder bottle assembly (1 and 2) in its bracket and secure by tightening two hex nuts (13) on straps (14).

B Install and connect cable assembly (8) to manual valve actuator guard (6) of engine cylinder bottle assembly no. 2 (2).

C Connect cable assembly to manual valve actuator of cylinder bottle assembly (2) with washer (7), pin (4) and new cotter pin (5).

D Readjust cable at actuator assembly (p 14-55).

E Remove anti-recoil plug (9) from discharge port of cylinder bottle assemblies (1 and 2).

F Connect elbows (10 and 12) and plug adapters (3 and 11) to discharge ports of engine compartment cylinder bottle assemblies (1 and 2). Remove locking pin (15) from valve actuator guard of engine extinguisher cylinder bottle no. 2.

G Reactivate engine AFES (p 14-14.5).

CREW AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 345 AND ABOVE)

INITIAL SETUP

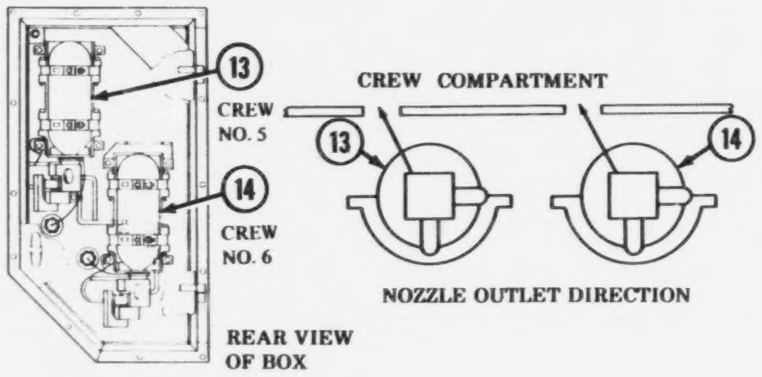
Equipment Condition:

Crew AFES deactivated (p 14-14.7).

General Safety Instructions:

Any AFES in need of maintenance or repair is more prone to accidental discharge. Accidental discharge could lead to frostbite or other injury. Small parts or tools become dangerous projectiles when propelled by Halon discharging at 750 psi.

Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles to prevent accidental discharge.



REMOVAL

A Deactivate crew AFES (p 14-14.7).

WARNING

Install locking pin (15) in valve actuator guards of crew extinguisher cylinder bottles no. 3 and no. 4 and make sure pins are installed in valve actuator guards of crew extinguisher cylinder bottles no. 1, no. 2, no. 5 and no. 6 before attempting to remove cylinder bottle assemblies.

B Install anti-recoil plugs (3) in discharge port of cylinder bottle assemblies (1, 2, 4, 12, 13 and 14).

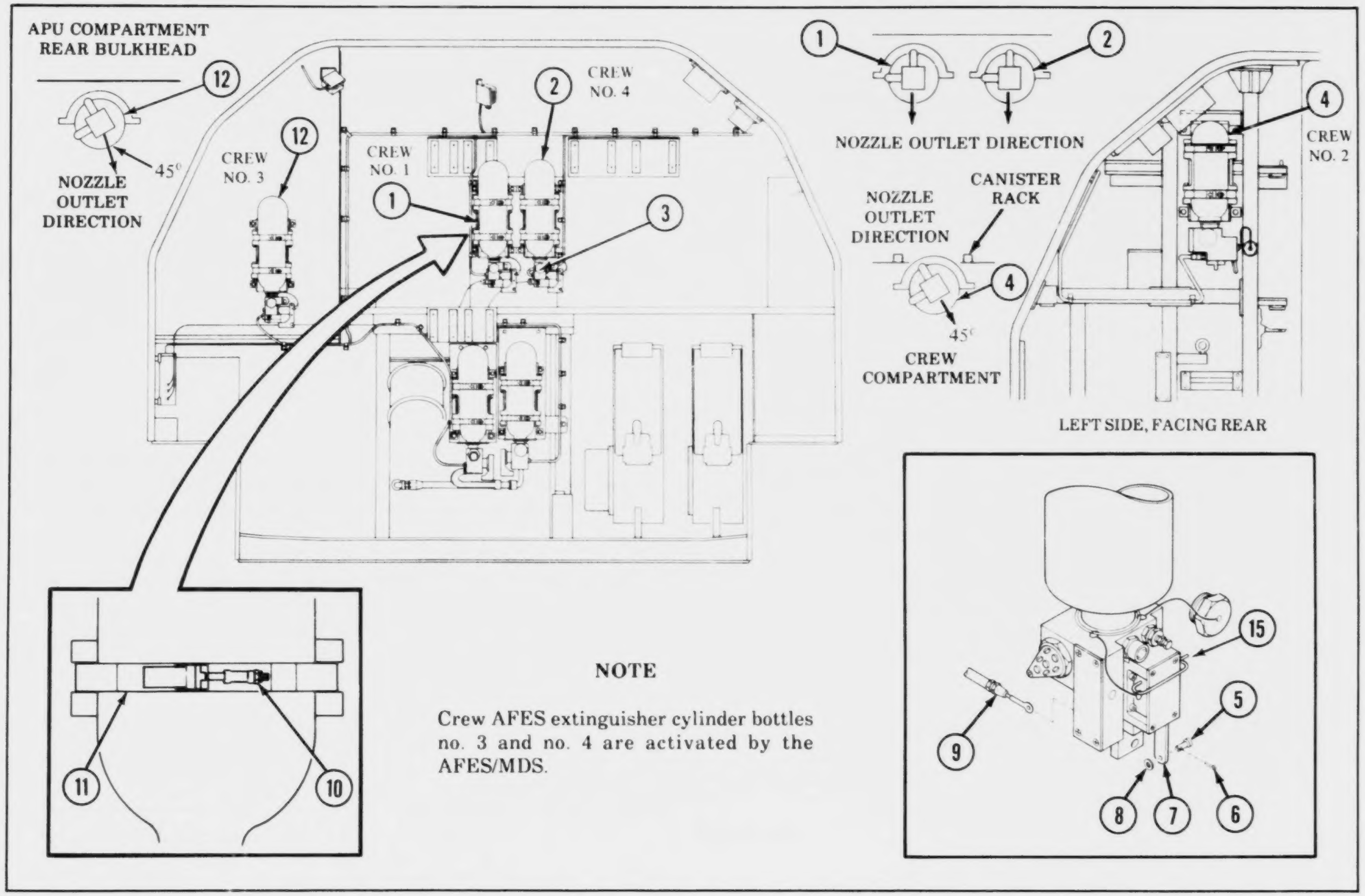
C Loosen cable at actuator assembly (p 14-52.20), then remove cotter pin (6), pin (5) and washer (8) to disconnect cable assembly (9) from manual valve actuator of cylinder bottle assemblies no. 3 and no. 4 (2 and 12). Discard cotter pin.

D Disconnect and remove cable assembly (9) from manual valve actuator guards (7) of crew cylinder bottle assemblies no. 3 and no. 4 (2 and 12).

E Loosen two hex nuts (10) and release strap (11) to remove each cylinder bottle assembly (1, 2, 4, 12, 13 and 14) from its bracket.

F Remove nozzles from cylinder bottle assemblies no. 5 and no. 6 (13 and 14) extenders (12) (p 14-14.4) and replace with anti-recoil plugs (3).

CREW AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 345 AND ABOVE) (CONTINUED)


APU COMPARTMENT REAR BULKHEAD
12
NOZZLE OUTLET DIRECTION
45°
CREW NO. 3
12
CREW NO. 1
1
2
CREW NO. 4
3
1
2
NOZZLE OUTLET DIRECTION
NOZZLE OUTLET DIRECTION
CANISTER RACK
4
45°
CREW COMPARTMENT
4
CREW NO. 2
LEFT SIDE, FACING REAR
11
10
15
9
5
8
7
6

NOTE

Crew AFES extinguisher cylinder bottles no. 3 and no. 4 are activated by the AFES/MDS.

CREW AFES CYLINDER BOTTLES: REMOVAL AND INSTALLATION (VEHICLES 345 AND ABOVE) (CONTINUED)

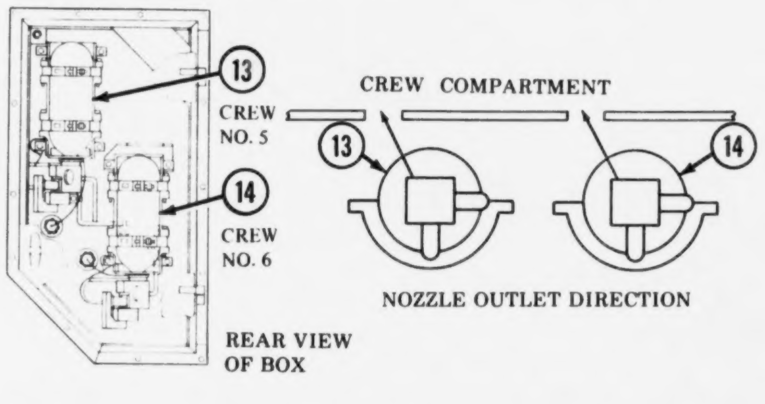
INSTALLATION

WARNING

Push up red valve flow indicator before installing extinguisher cylinder bottles in correct position. Failure to reset valve may discharge extinguishers and incorrect position may render extinguishers useless in putting out crew compartment fires, causing serious injury to personnel and equipment.

NOTE

The two engine compartment cylinder bottles are larger than the crew compartment cylinder bottles.



A Install each cylinder bottle assembly (1, 2, 4, 12, 13 and 14) in its bracket and secure by tightening two hex nuts (10) on straps (11).

B Install and connect cable assembly (9) to manual valve actuator guards (7) of crew cylinder bottle assemblies no. 3 and no. 4 (2 and 12).

C Connect cable assembly (9) to manual valve actuator of cylinder bottle assemblies no. 3 and no. 4 (2 and 12) with washer (8) pin (5) and new cotter pin (6).

D Readjust cable at actuator assembly (p 14-55).

E Remove anti-recoil plug (3) from discharge port of cylinder bottle assemblies (1, 2, 4, 12, 13 and 14). Remove locking pin (15) from valve actuator guard of engine extinguisher cylinder bottle no. 2.

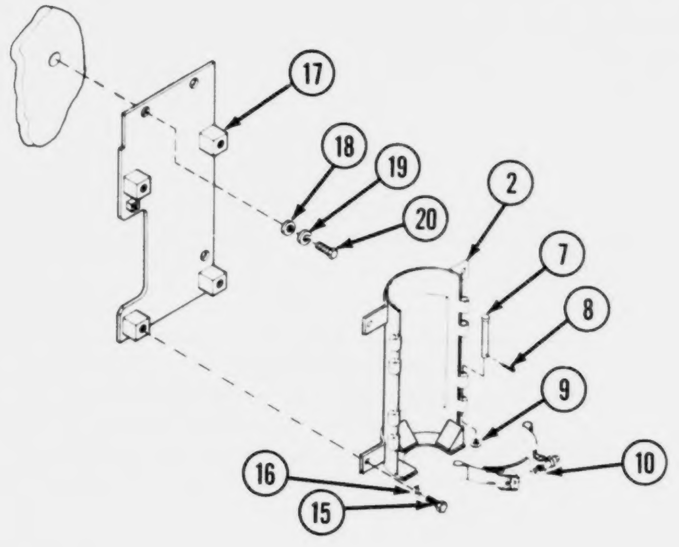
F Install extender (12) (p 14-14.4) in discharge port of cylinder bottles no. 5 and no. 6 (13 and 14).

WARNING

Remove locking pins (15) from valve actuator guards of crew extinguisher cylinder bottles no. 3 and no. 4 before reactivating crew AFES.

G Reactivate crew AFES (p 14-14.8).

ENGINE AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION


17
18
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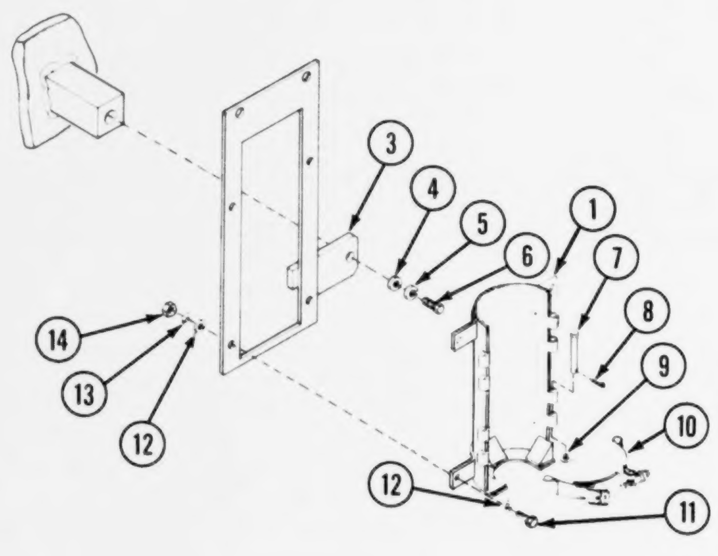
16
15

ENGINE NO. 1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12
11

ENGINE NO. 2

ENGINE AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

INITIAL SET UP

Equipment Condition:

Engine AFES cylinder bottle assemblies removed (p 14-28.2).

REMOVAL

NOTE

All bracket straps are removed in the same manner.

A Remove two bracket straps (10) from brackets (1 or 2) by removing two cotter pins (8), two flat washers (9) and two straight pins (7) from each strap. Discard cotter pins.

B Remove bracket (1) from mount (3) by removing four nuts (14), four lockwashers (13), eight flat washers (12) and four screws (11). Discard lockwashers.

C Remove mount (3) from vehicle by removing three screws (6), three lockwashers (5) and three flat washers (4). Discard lockwashers.

D Remove bracket (2) from mount (17) by removing four screws (15) and four lockwashers (16). Discard lockwashers.

E Remove mount (17) from vehicle by removing three screws (20), three lockwashers (19) and three flat washers (18). Discard lockwashers.

INSTALLATION

A Install two bracket straps (10) on brackets (1 or 2) with two straight pins (7), two flat washers (9) and two new cotter pins (8) for each strap.

B Install mount (17) in vehicle with three screws (20), three new lockwashers (19) and three flat washers (18).

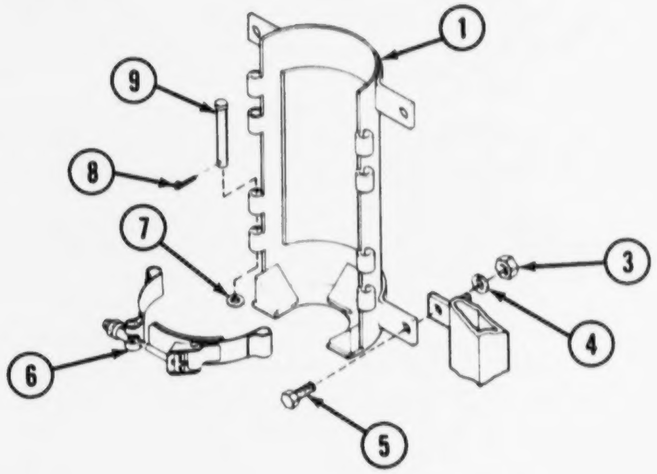
C Install bracket (2) on mount (17) with four screws (15) and four new lockwashers (16).

D Install mount (3) in vehicle with three screws (6), three new lockwashers (5) and three flat washers (4).

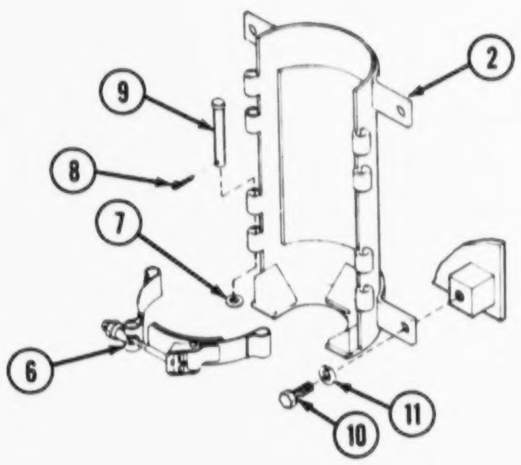
E Install bracket (1) on mount (3), with four screws (11), eight flat washers (12), four new lockwashers (13) and four nuts (14).

F Install engine AFES cylinder bottle assemblies (p 14-28.2).

CREW AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION



CREW NO. 2



CREW NOS. 1, 3, 4

CREW AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

INITIAL SET UP

Equipment Condition:

Crew AFES cylinder bottle assemblies removed (p 14-28.3).

REMOVAL

NOTE

All bracket straps are removed in the same manner.

A Remove two bracket straps (6) from brackets (1 or 2) by removing two cotter pins (8), two flat washers (7) and two straight pins (9) from each strap. Discard cotter pins.

B Remove bracket (1) from canister rack by removing four nuts (3), four lockwashers (4) and four screws (5). Discard lockwashers.

C Remove bracket (2) from APU bulkhead of front crew compartment bulkhead by removing four screws (10) and four lockwashers (11). Discard lockwashers.

INSTALLATION

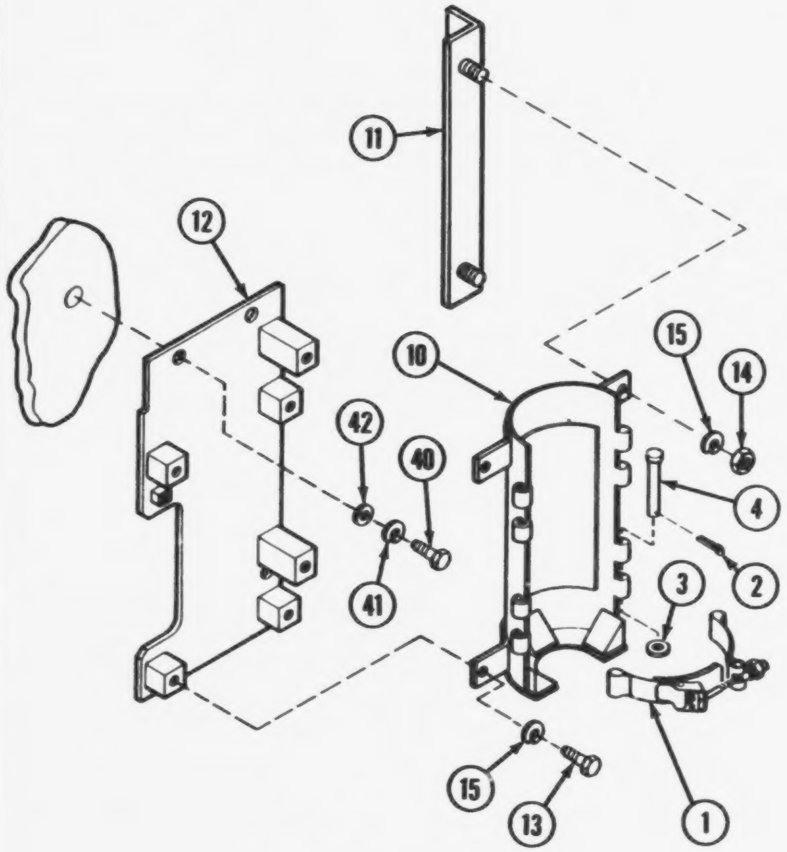
A Install two bracket straps (6) on brackets (1 or 2) with two straight pins (9), two flat washers (7) and two new cotter pins (8) for each strap.

B Install bracket (2) on APU bulkhead or front crew compartment bulkhead with four screws (10) and four new lockwashers (11).

C Install bracket (1) on canister rack with four nuts (3), four new lockwashers (4) and four screws (5).

D Install crew AFES cylinder bottle assemblies (p 14-28.3).

ENGINE AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION



ENGINE NO. 2

INITIAL SET UP

Equipment Condition:

Engine AFES cylinder bottle assemblies removed (14-28.6).

REMOVAL

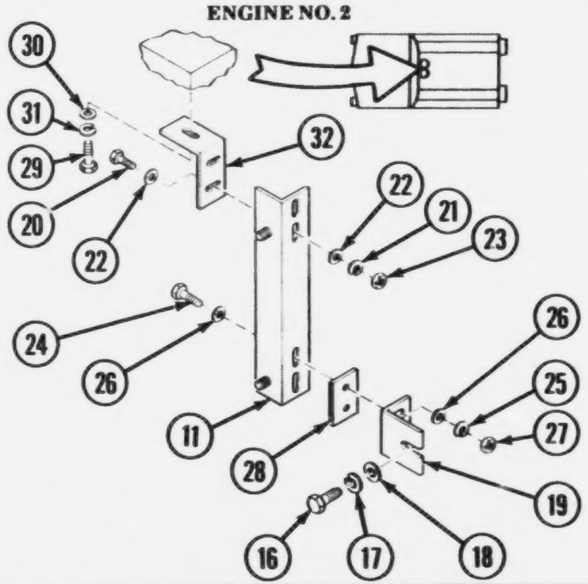
NOTE

All bracket straps are removed in the same manner.

A Remove two bracket straps (1) by removing two cotter pins (2), two flat washers (3) and two straight pins (4) from each strap. Discard cotter pins.

B Remove bracket (10) from support (11) and mount (12) by removing two screws (13), two nuts (14) and four lockwashers (15). Discard lockwashers.

ENGINE AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



C Remove screw (16), lockwasher (17), and flat washer (18). Discard lockwasher.

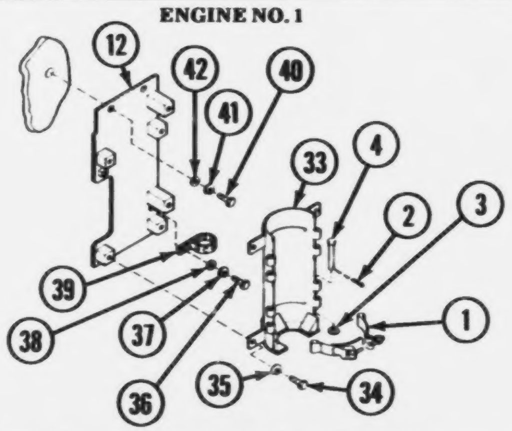
D Remove support (11) and bracket (19) from angle (32) by removing two screws (20), two lockwashers (21), four flat washers (22) and two nuts (23). Discard lockwashers.

NOTE

Record number of shims removed. The same number must be replaced during installation.

E Remove support (11) from bracket (19) by removing two screws (24), two lockwashers (25), four flat washers (26), two nuts (27) and shim(s) (28). Discard lockwashers.

F Remove screw (29), flat washer (30), lockwasher (31) and angle bracket (32). Discard lockwasher.

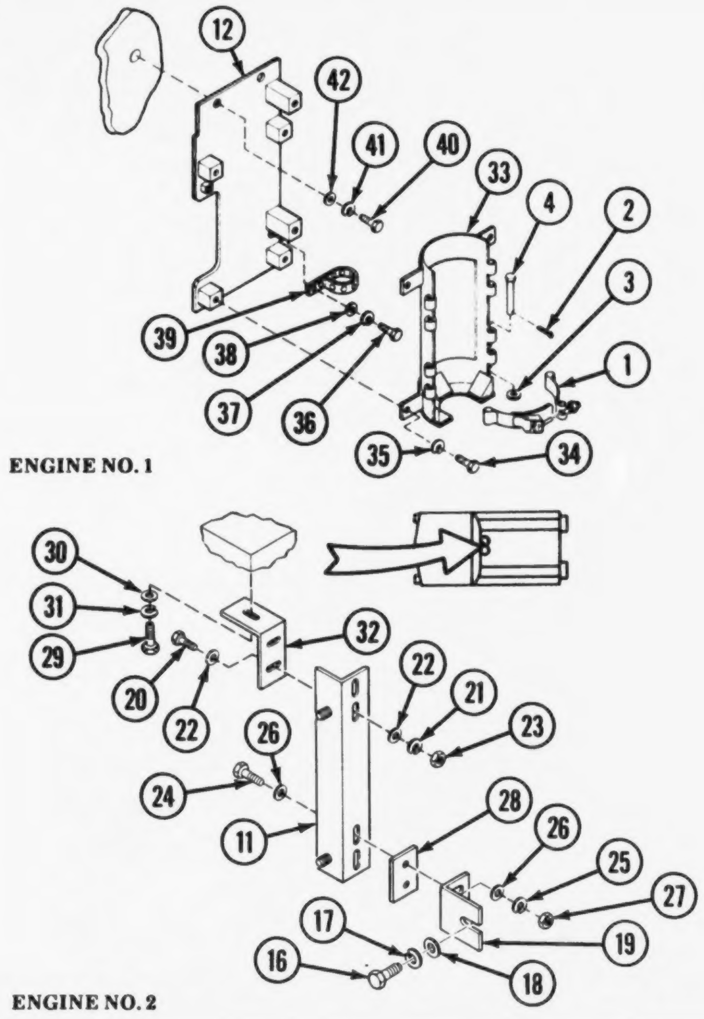


G Remove bracket (33) from mount (12) by removing four screws (34) and four lockwashers (35). Discard lockwashers.

H Remove bolt (36), lockwasher (37), flat washer (38), clamp (39) and disconnect wiring harness. Discard lockwasher.

I Remove mount (12) by removing two screws (40), two lockwashers (41) and two flat washers (42). Discard lockwashers.

ENGINE AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)


12
42
41
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34
ENGINE NO. 1
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18
ENGINE NO. 2

INSTALLATION

A Connect wiring harness and install clamp (39), flat washer (38), new lockwasher (37) and bolt (36).

B Install mount (12) with two screws (40), two new lockwashers (41) and two flat washers (42).

C Install bracket (33) on mount (12) with four screws (34) and four new lockwashers (35).

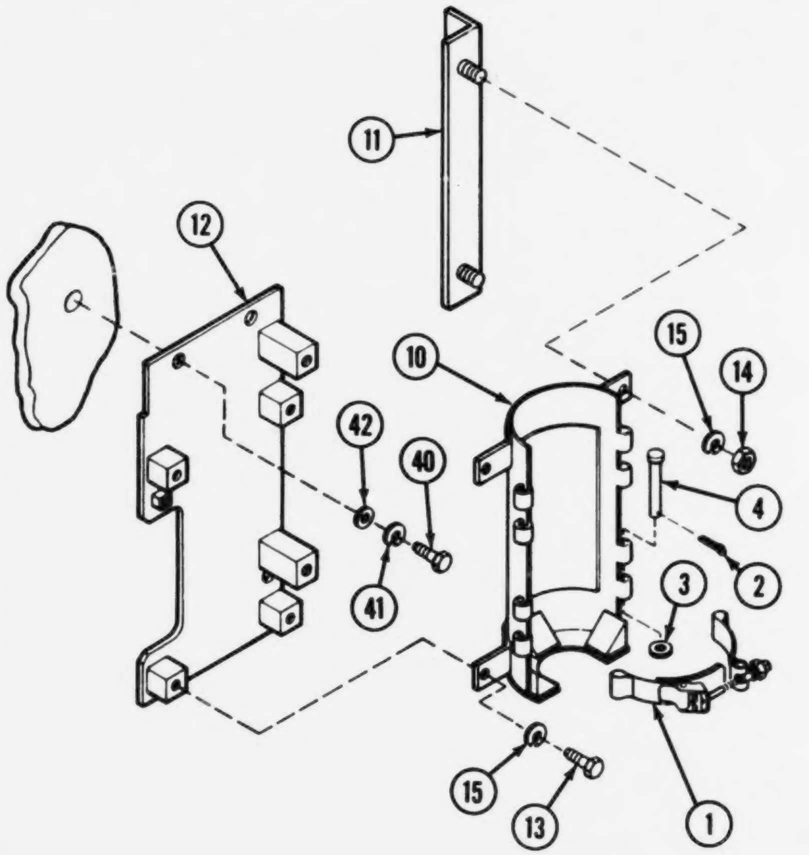
D Install angle bracket (32) with screw (29), new lockwasher (31) and flat washer (30).

E Install support (11) and shim(s) (28) on bracket (19) with two screws (24), two new lockwashers (25), four flat washers (26) and two nuts (27).

F Install support (11) and bracket (19) on angle (32) with two screws (20), two new lockwashers (21), four flat washers (22) and two nuts (23).

G Install screw (16), new lockwasher (17) and flat washer (18).

ENGINE AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



ENGINE NO. 2

H Install bracket (10) on support (11) and mount (12) with two screws (13), two nuts (14) and four new lockwashers (15).

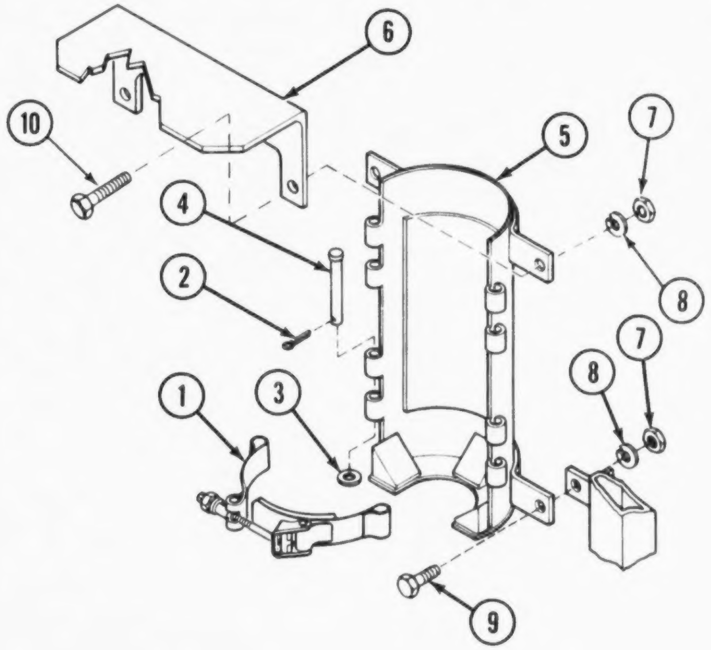
I Install two bracket straps (1) with two new cotter pins (2), two flat washers (3) and two straight pins (4) on each strap.

CREW AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION

INITIAL SET UP

Equipment Condition:

Crew AFES cylinder bottle assemblies removed (14-28.9).



CREW NO. 2

REMOVAL

NOTE

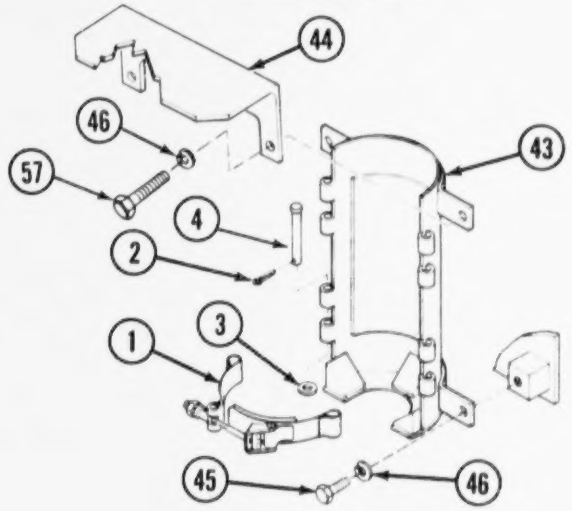
All bracket straps are removed in the same manner.

A Remove two bracket straps (1) by removing two cotter pins (2), two flat washers (3) and two straight pins (4) from each strap. Discard cotter pins.

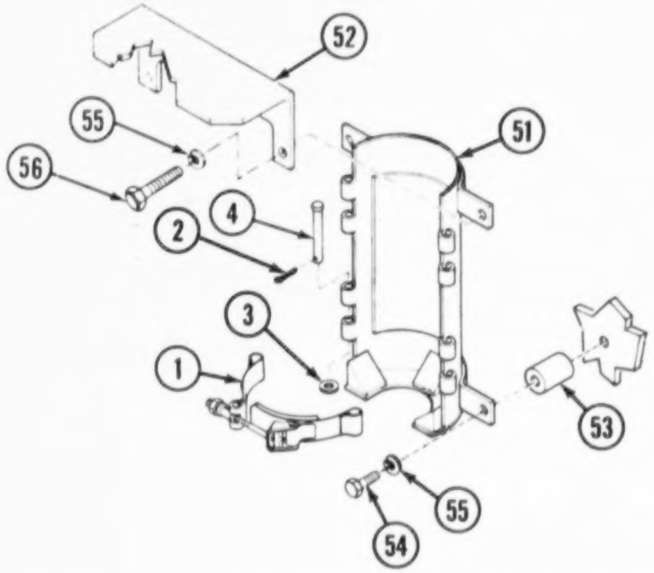
B Remove bracket (5) and bracket (6) from canister rack by removing four nuts (7), four lockwashers (8), two screws (9), and two screws (10). Discard lockwashers.

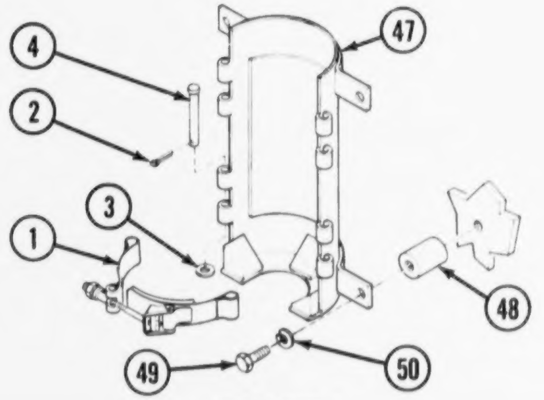
CREW AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

CREW NOS. 1, 3 AND 4



CREW NO. 6





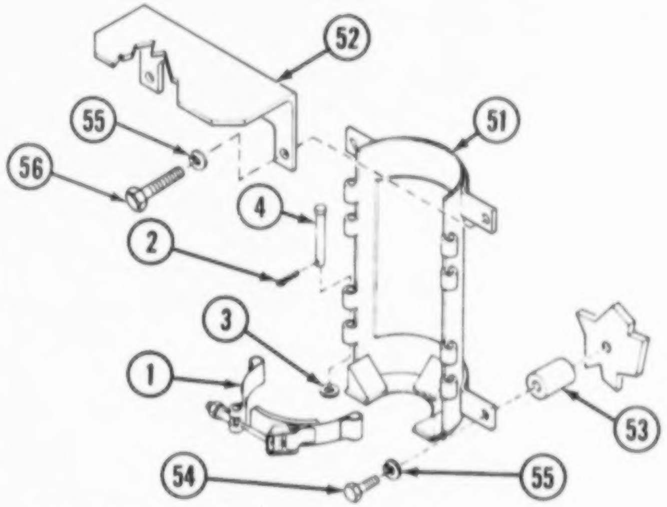
CREW NO. 5

C Remove bracket (43) and bracket (44) from APU bulkhead on front crew compartment bulkhead by removing two screws (45), four lockwashers (46) and two screws (57). Discard lockwashers.

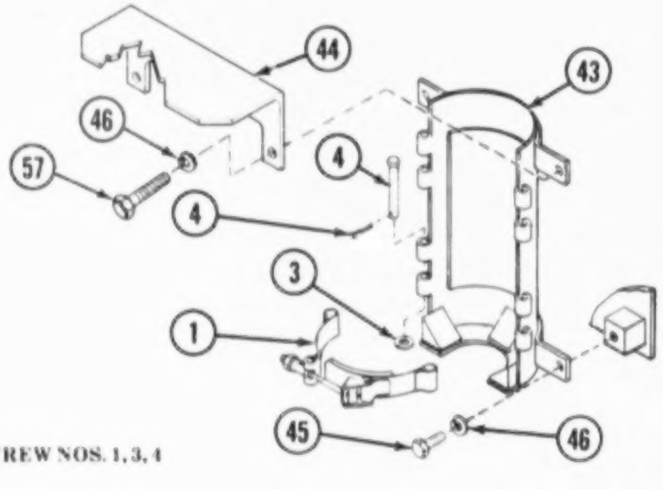
D Remove bracket (47) and spacers (48) from rear of vehicle by removing four screws (49) and four lockwashers (50). Discard lockwashers.

E Remove bracket (51), bracket (52), and spacers (53) from rear of vehicle by removing two screws (54), four lockwashers (55) and two screws (56). Discard lockwashers.

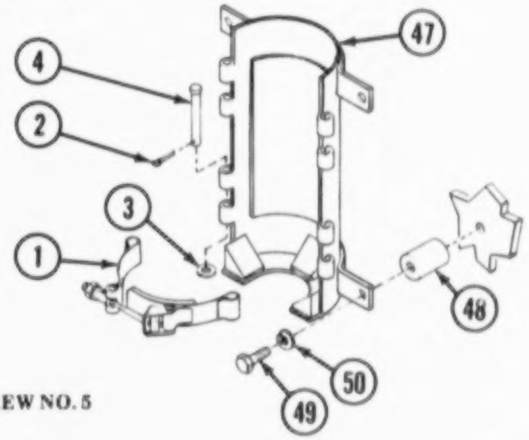
CREW AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



CREW NO.6



CREW NOS. 1, 3, 4



CREW NO. 5

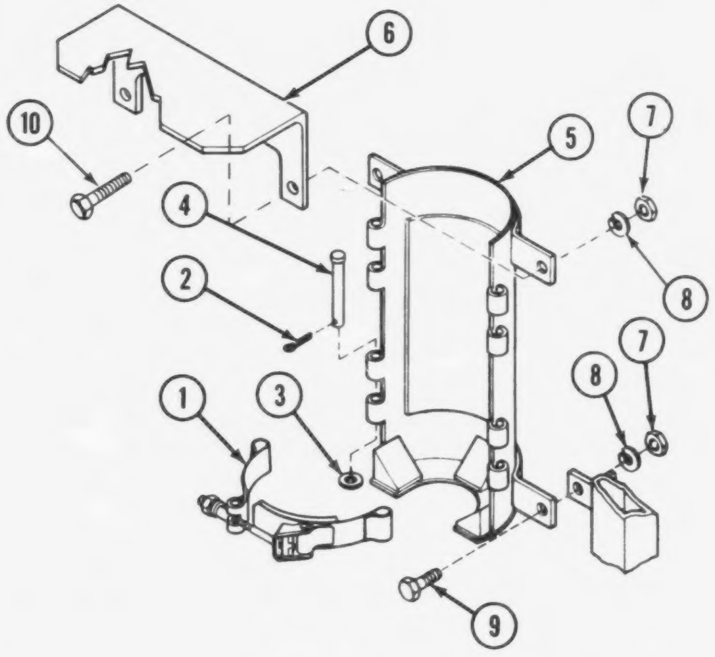
INSTALLATION

A Install bracket (51), bracket (52) and spacers (53) on rear of vehicle with two screws (54), four new lockwashers (55) and two screws (56).

B Install bracket (47) and spacers (48) on rear of vehicle with four screws (49) and four new lockwashers (50).

C Install bracket (43) and bracket (44) on APU bulkhead on front crew compartment bulkhead with two screws (45), four new lockwashers (46) and two screws (57).

CREW AFES CYLINDER BOTTLE BRACKET STRAPS, BRACKETS AND MOUNTS (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



D Install bracket (5) and bracket (6) on canister rack with four nuts (7), four new lockwashers (8), two screws (9) and two screws (10).

E Install two bracket straps (1) with two new cotter pins (2), two flat washers (3) and two straight pins (4) on each strap.

CREW NO. 2

ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION

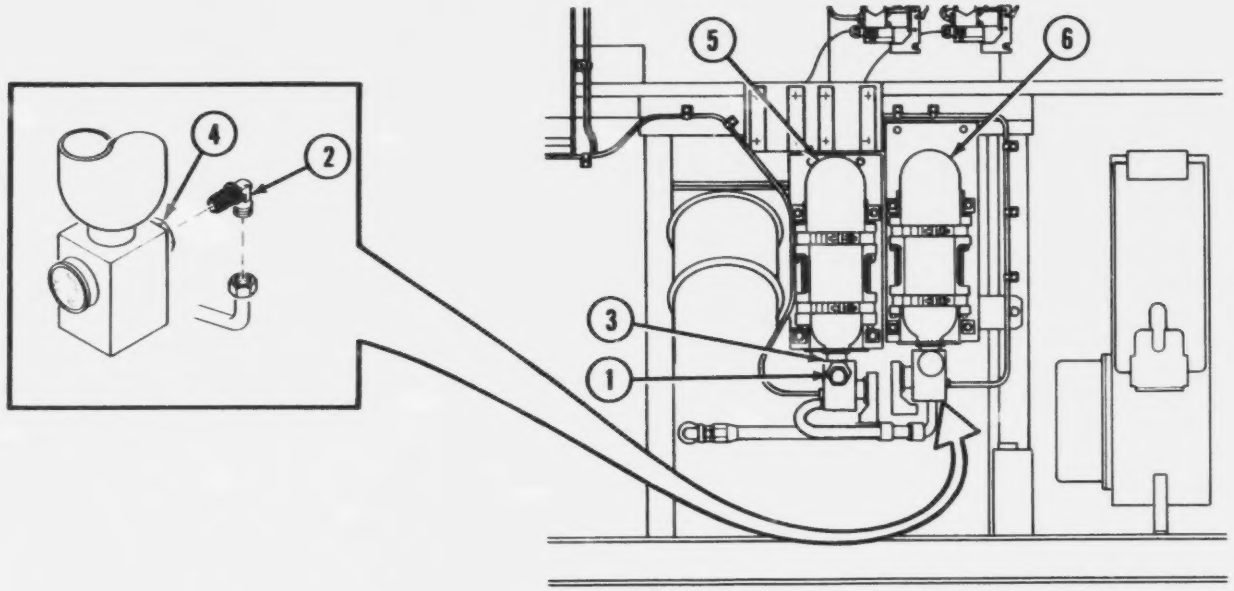
INITIAL SET UP

Equipment Condition:

Projectile racks removed (crew compartment only) (p 11-5).
Powerpack removed (engine compartment only) (p 3-1).
Engine AFES deactivated (p 14-14.3).

General Safety Instruction:

Any AFES in need of maintenance or repair is more likely to discharge accidentally. Read and follow all warnings.



FORWARD BULKHEAD - CREW COMPARTMENT

ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION (CONTINUED)

WARNING

- Turn MAINTenance switch on engine T/A panel to vertical position.
- To prevent injury from accidental manual discharge of cylinders, install locking pin in valve actuator guard of each cylinder. Also, install and hand tighten anti-recoil plug in each valve discharge port.
- Use caution when working near fire extinguisher nozzles. When nozzles discharge, frostbite may occur to personnel, and small objects may become projectiles causing SERIOUS INJURY or damage.
- Do not strike cylinder bottles with tools. Do not drop cylinder bottles. Be careful when handling cylinder bottles.

CREW COMPARTMENT

NOTE

Tubing for engine AFES is located in both the engine and crew compartments. Nozzles are located only in the engine compartment.

REMOVAL

NOTE

Loosen right side engine AFES bottle straps and rotate bottle to provide access for removing elbow (p 14-28.1).

A Disconnect tubes at elbows (1 and 2) and remove elbows (1 and 2) from discharge plug adapters (3 and 4).

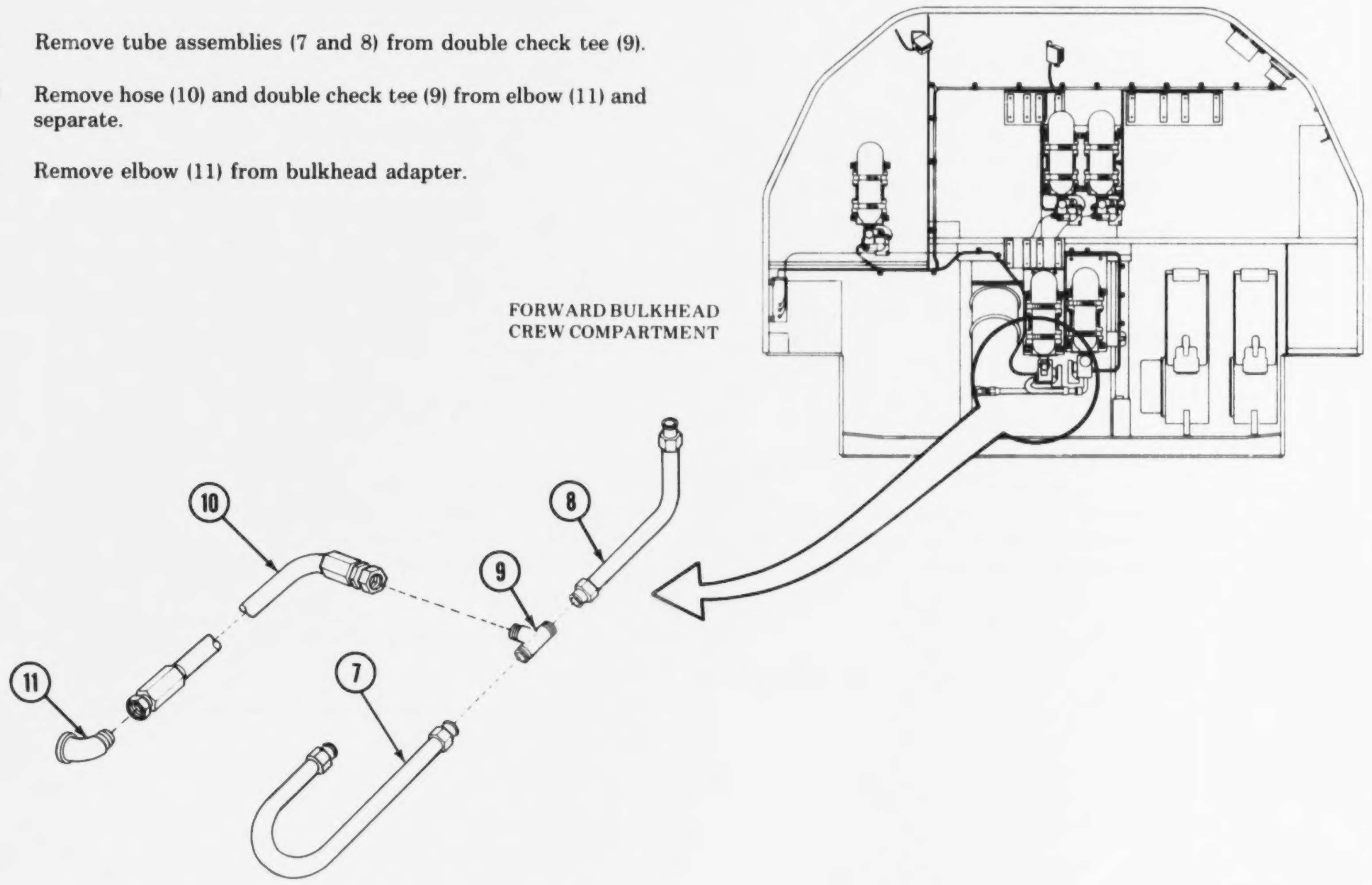
B Remove plug adapters (3 and 4) and install anti-recoil plugs in discharge ports of cylinder bottles (5 and 6).

ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION (CONTINUED)

C Remove tube assemblies (7 and 8) from double check tee (9).

D Remove hose (10) and double check tee (9) from elbow (11) and separate.

E Remove elbow (11) from bulkhead adapter.


FORWARD BULKHEAD
CREW COMPARTMENT
10
8
9
11
7

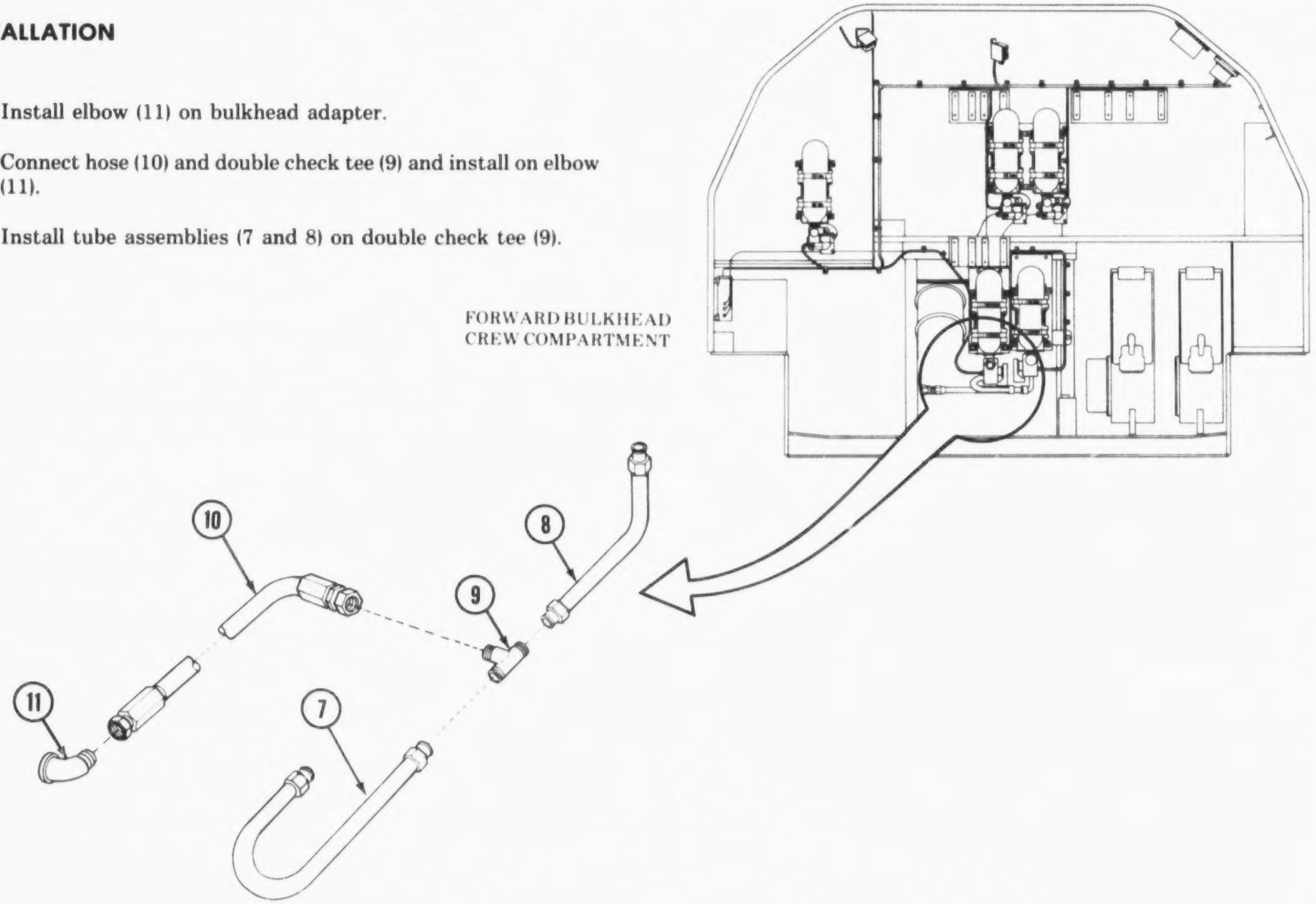
ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Install elbow (11) on bulkhead adapter.

B Connect hose (10) and double check tee (9) and install on elbow (11).

C Install tube assemblies (7 and 8) on double check tee (9).


FORWARD BULKHEAD
CREW COMPARTMENT
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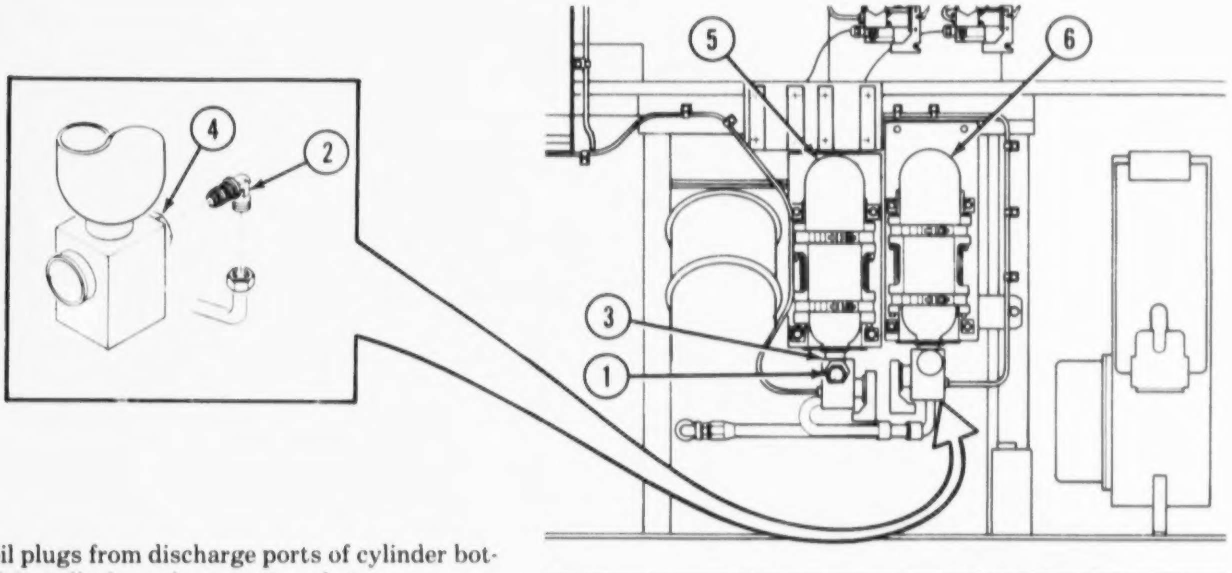
ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION (CONTINUED)



FORWARD BULKHEAD - CREW COMPARTMENT

D Remove anti-recoil plugs from discharge ports of cylinder bottles (5 and 6) and install plug adapters (3 and 4).

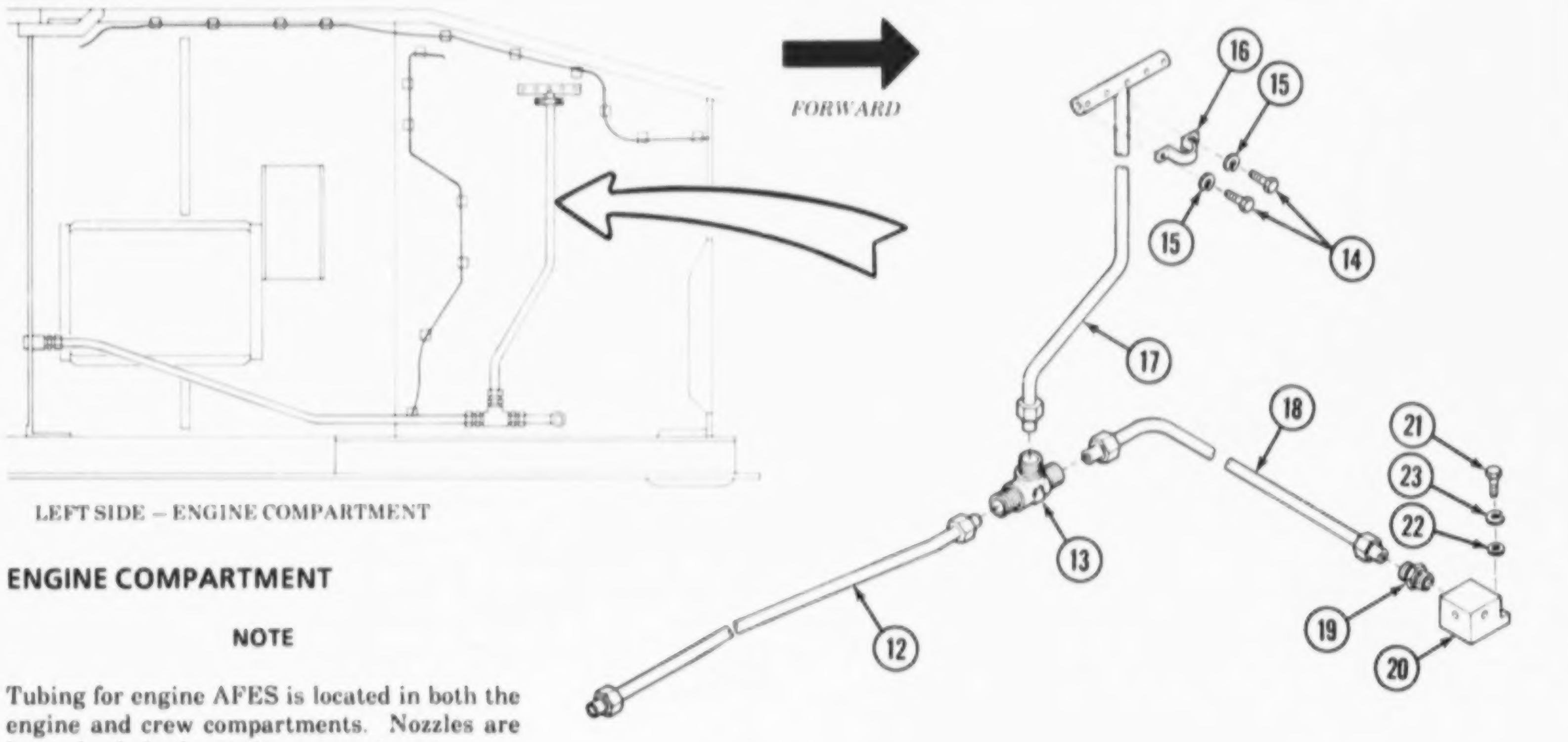
E Install elbows (1 and 2) on discharge plug adapters (3 and 4).

F Connect tubes to elbows (1 and 2).

NOTE

Reposition right side engine AFES bottle to correct position and tighten bottle straps (p 14-28.1).

ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE – ENGINE COMPARTMENT

ENGINE COMPARTMENT

NOTE

Tubing for engine AFES is located in both the engine and crew compartments. Nozzles are located only in the engine compartment.

REMOVAL

A Remove tube (12) from tee (13) and bulkhead connector.

B Remove two screws (14), two lockwashers (15) and strap (16). Discard lockwashers.

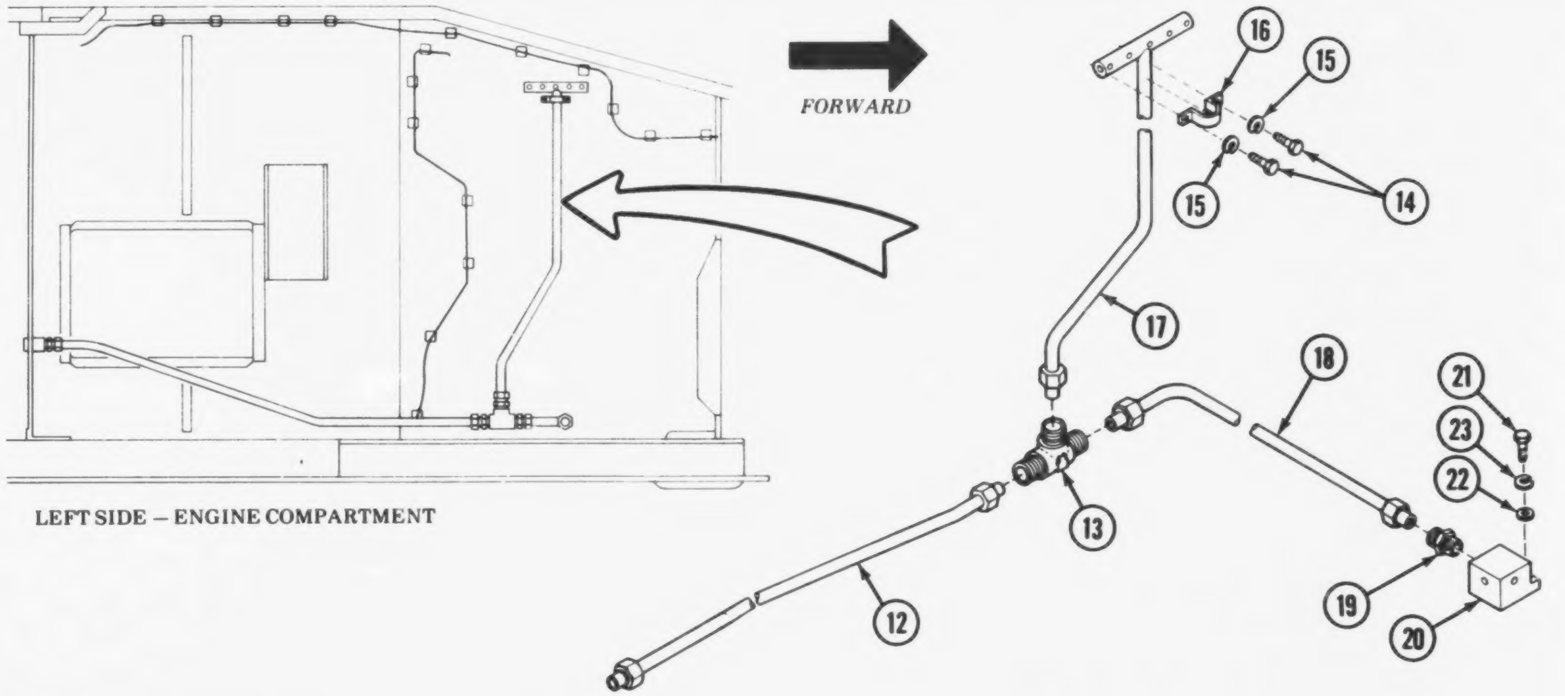
C Remove tube assembly (17) from tee (13).

D Remove tube assembly (18) from tee (13) and adapter (19).

E Remove adapter (19) from nozzle (20).

F Remove two screws (21), two flat washers (22), two lockwashers (23) and nozzle (20). Discard lockwashers.

ENGINE AFES TUBING AND NOZZLES: REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE – ENGINE COMPARTMENT

ENGINE COMPARTMENT

INSTALLATION

A Install two screws (21), two flat washers (22), two new lockwashers (23) and nozzle (20).

B Install adapter (19) on nozzle (20).

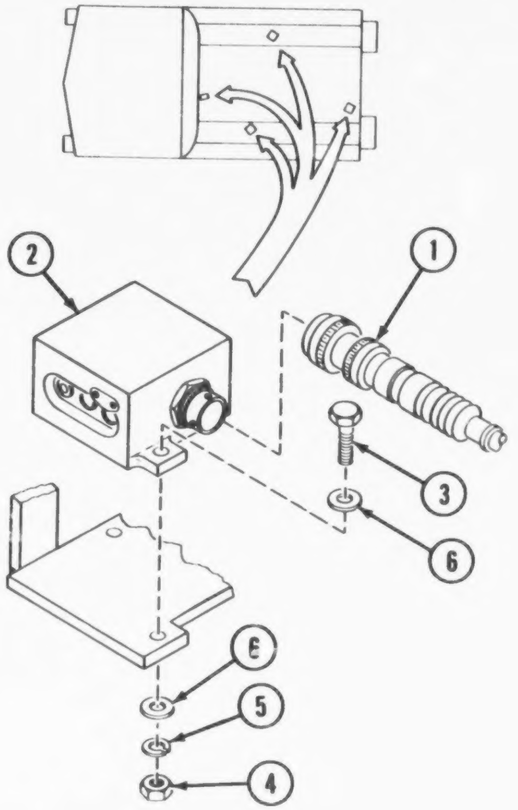
C Install tube assembly (18) on tee (13) and adapter (19).

D Install tube assembly (17) on tee (13).

E Install two screws (14), two new lockwashers (15) and strap (16).

F Install tube (12) on tee (13) and bulkhead connector.

CREW AFES - OPTICAL FIRE SENSING APPARATUS (OFSA): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn crew T/A panel MAINTenance switch to vertical position before removing an OFSA detector.

CAUTION

Note position of OFSA before removal. Installed position of OFSA is critical - install in correct position.

NOTE

Removal procedures for all four fire sensing apparatuses are the same.

A Disconnect electrical cable (1) from OFSA (2).

B Remove two screws (3), two nuts (4), two lockwashers (5) and four flat washers (6). Discard lockwashers.

C Remove OFSA (2) from bracket.

INSTALLATION

WARNING

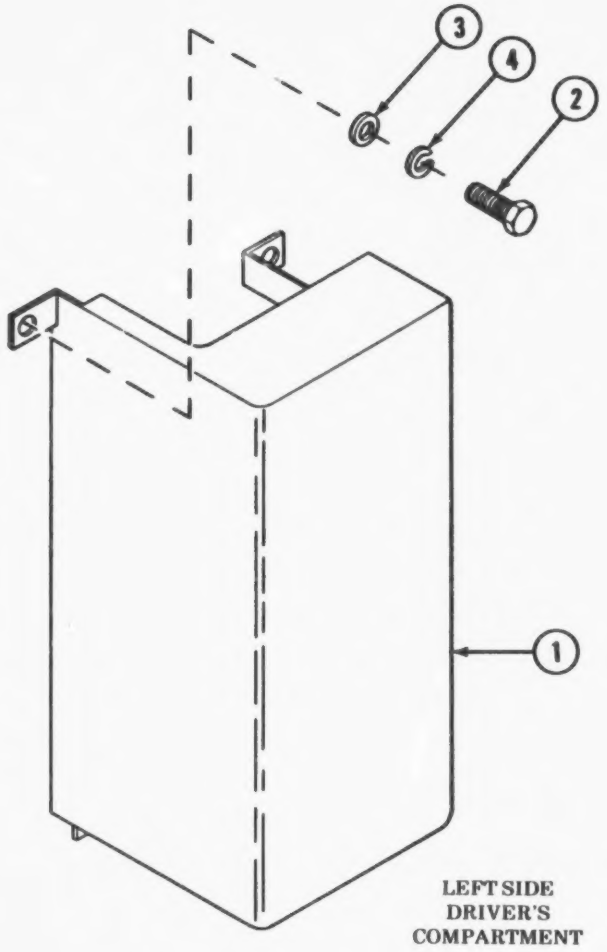
Install OFSA in same position as noted at removal. If installed in wrong position, OFSA will not be effective in detecting fires.

A Clean OFSA lenses (TM 9-2350-267-10).

B Reverse order of removal procedures using new lockwashers. When installing electrical cable (1), turn clockwise until cable snaps in place.

C Turn crew T/A panel MAINTenance switch to horizontal position.

ENGINE AFES RELAYS COVER: REMOVAL AND INSTALLATION (CONTINUED)



REMOVAL

WARNING

Do not allow metal objects (screwdriver, wrench, etc.) to cross any relay terminals. Crossing terminals may cause accidental discharge of AFES extinguisher bottles.

A Remove engine T/A panel bracket (p 14-39).

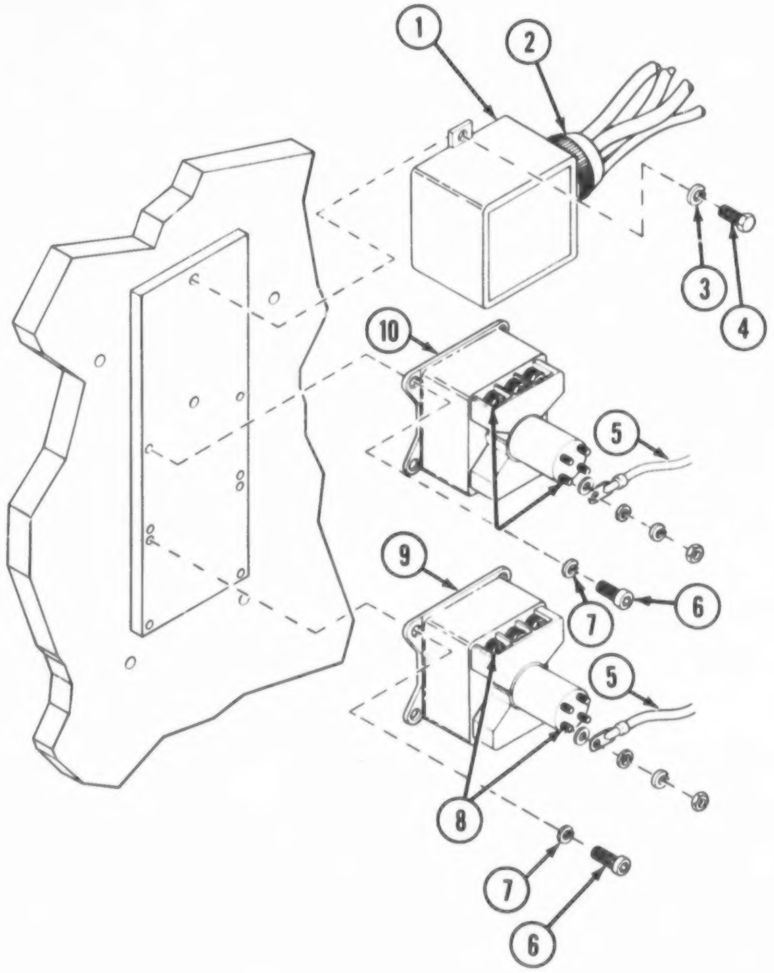
B Remove AFES relays cover (1) by removing four screws (2), four flat washers (3) and four lockwashers (4). Discard lockwashers.

INSTALLATION

A Install AFES relays cover (1) using four screws (2), four flat washers (3) and four new lockwashers (4).

B Replace engine T/A panel bracket (p 14-39).

ENGINE AFES ELECTRICAL RELAYS: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Turn MASTER switch OFF. Disconnect battery ground cables before disconnecting cable assembly.

A Remove engine AFES relay cover (p 14-35).

B To remove upper relay (1), disconnect plug (2) and remove two mounting screws (4) and two lockwashers (3). Discard lockwashers.

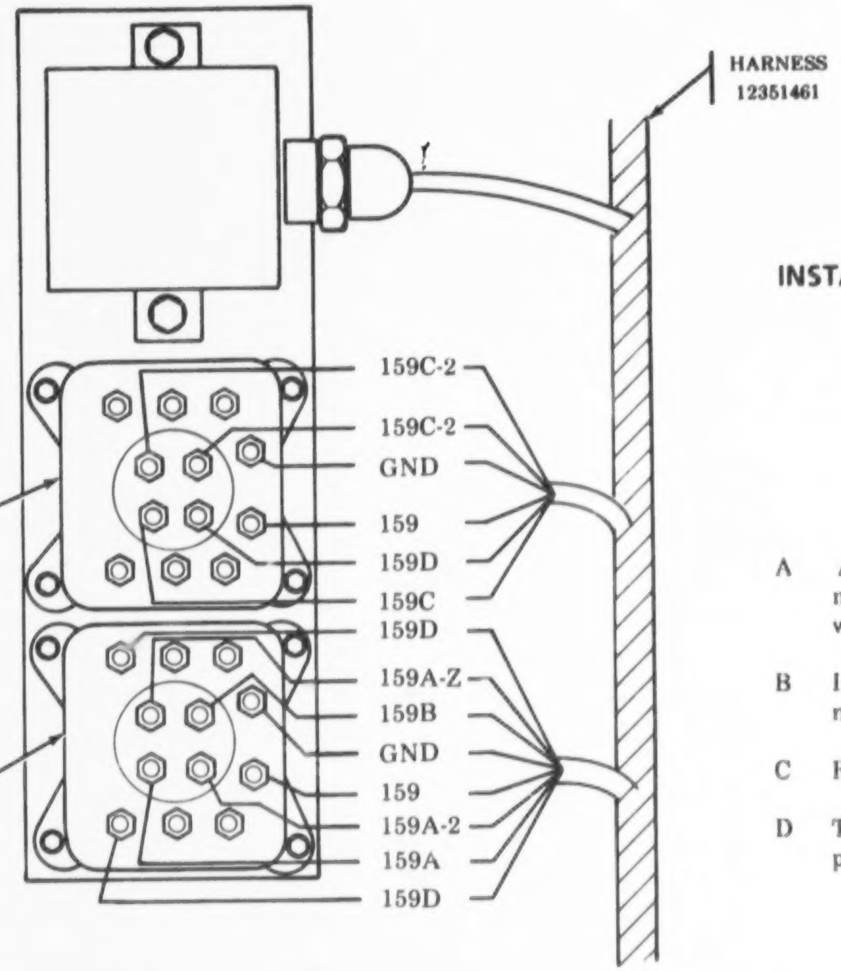
NOTE

There are six wires connected to the middle relay and eight wires connected to the bottom relay.

C To remove two lower relays (9 and 10) from plate, disconnect wires (5) from terminals (8), and remove four mounting screws (6) and four lockwashers (7). Discard lockwashers.

D Remove relay from vehicle.

ENGINE AFES ELECTRICAL RELAYS: REMOVAL AND INSTALLATION (CONTINUED)


HARNESS
12351461
6
7
159C-2
159C-2
GND
159
159D
159C
159D
159A-Z
159B
GND
159
159A-2
159A
159D

INSTALLATION

NOTE

There are six wires connected to the middle relay, and eight wires connected to the bottom relay. Reconnect wires from harness 12351461 to terminals of two relays (6 and 7), using diagram.

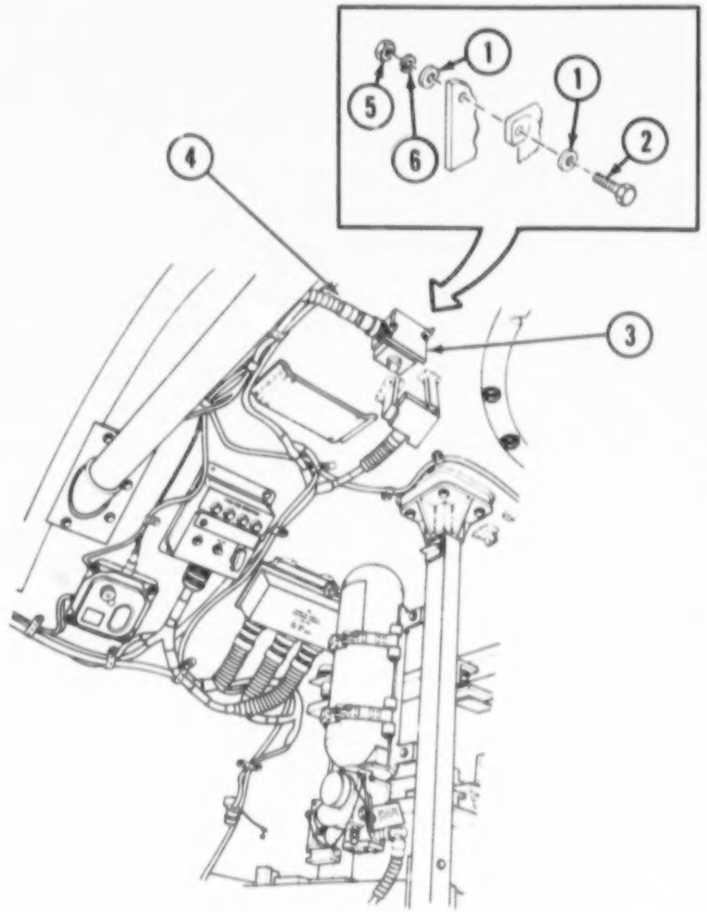
A Attach two lower relays (9 and 10) to plate using four mounting screws (6) and four new lockwashers (7). Connect wires (5) to terminals (8).

B Install upper relay (1) using two mounting screws (4) and two new lockwashers (3). Connect plug (2).

C Replace engine AFES relay cover (p 14-35).

D Turn engine T/A panel MAINTenance switch to horizontal position.

ENGINE AFES REMOTE STATUS INDICATOR (RSI): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

A Disconnect wiring harness plug (4) from RSI (3).

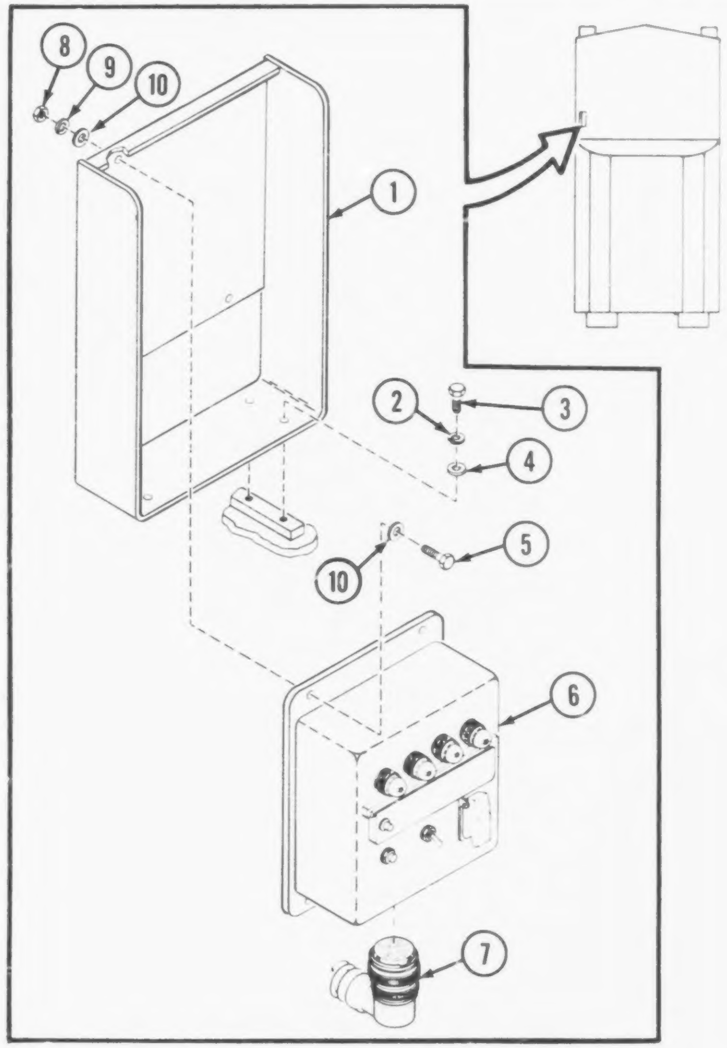
B Support RSI and remove two nuts (5), two lockwashers (6), four flat washers (1) and two screws (2) which hold RSI to ceiling bracket. Remove RSI. Discard lockwashers.

INSTALLATION

A Attach RSI to ceiling bracket using two nuts (5), two new lockwashers (6), four flat washers (1) and two screws (2). Tighten securely.

B Connect wiring harness plug (4) to RSI (3).

ENGINE AFES TEST AND ALARM PANEL: REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn engine T/A panel MAINTenance switch to vertical position. Make sure locking pin is installed in valve actuator guard of engine extinguisher cylinder bottle no. 1 and install locking pin in valve actuator guard of engine extinguisher cylinder bottle no. 2.

A Disconnect wiring harness plug (7) from engine T/A panel (6).

B Support engine T/A panel and remove four nuts (8), four lockwashers (9), eight flat washers (10) and four screws (5) which hold panel to bracket (1). Remove panel and discard lockwashers.

C Remove four screws (3), four lockwashers (2) and four flat washers (4) which hold bracket to sponson. Remove bracket and discard lockwashers.

INSTALLATION

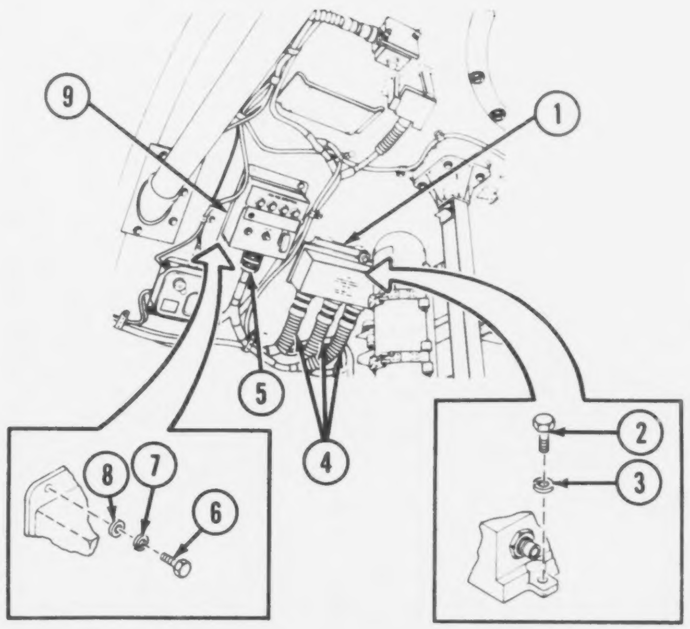
A Attach bracket (1) securely to sponson using four flat washers (4), four new lockwashers (2) and four screws (3).

B Attach engine T/A panel (6) to bracket using four screws (5), eight flat washers (10), four new lockwashers (9) and four nuts (8). Tighten securely.

C Connect wiring harness plug (7) to engine T/A panel.

D Turn engine T/A panel MAINTenance switch to horizontal position.

CREW AFES TEST AND ALARM (T/A) PANEL AND STANDARD CONTROL ELECTRONIC AMPLIFIER (SCEA): REMOVAL AND INSTALLATION



REMOVAL

WARNING

Turn crew T/A panel MAINTenance switch to vertical position. Make sure locking pins are installed in valve actuator guards of crew extinguisher cylinder bottles no. 1 and no. 2 (vehicles 1 thru 344) and no. 1, no. 2 , no. 5 and no. 6 (vehicles 345 and above). Install locking pins in valve actuator guards of extinguisher cylinder bottles no. 3 and no. 4. Install anti-recoil plugs in discharge port of each crew compartment extinguisher bottle.

CREW T/A PANEL: REMOVAL

A Disconnect wiring harness plug (5) from crew T/A panel (9).

B Support crew T/A panel and remove four screws (6), four lockwashers (7) and four flat washers (8) which hold panel to hull. Remove panel and discard lockwashers.

SCEA UNIT: REMOVAL

A Disconnect three wiring harness plugs (4) from SCEA unit (1).

B Support SCEA and remove two screws (2) and two lockwashers (3) which hold panel to hull. Remove SCEA and discard lockwashers.

CREW AFES TEST AND ALARM (T/A) PANEL AND STANDARD CONTROL ELECTRONIC AMPLIFIER (SCEA): REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

WARNING

Turn crew T/A panel MAINTenance switch to vertical position. Make sure locking pins are installed in valve actuator guards of crew extinguisher cylinder bottles no. 1 and no. 2, (vehicles 1 thru 344) and no. 1, no. 2 , no. 5 and no. 6 (vehicles 345 and above). Install locking pins in valve actuator guards of extinguisher cylinder bottles no. 3 and no. 4. Install anti-recoil plugs in discharge port of each crew compartment extinguisher cylinder bottle.

CREW T/A PANEL: INSTALLATION

A Attach crew T/A panel (9) to hull using four screws (6), four new lockwashers (7) and four flat washers (8). Tighten securely.

B Connect wiring harness plug (5) to crew T/A panel (9).

SCEA UNIT: INSTALLATION

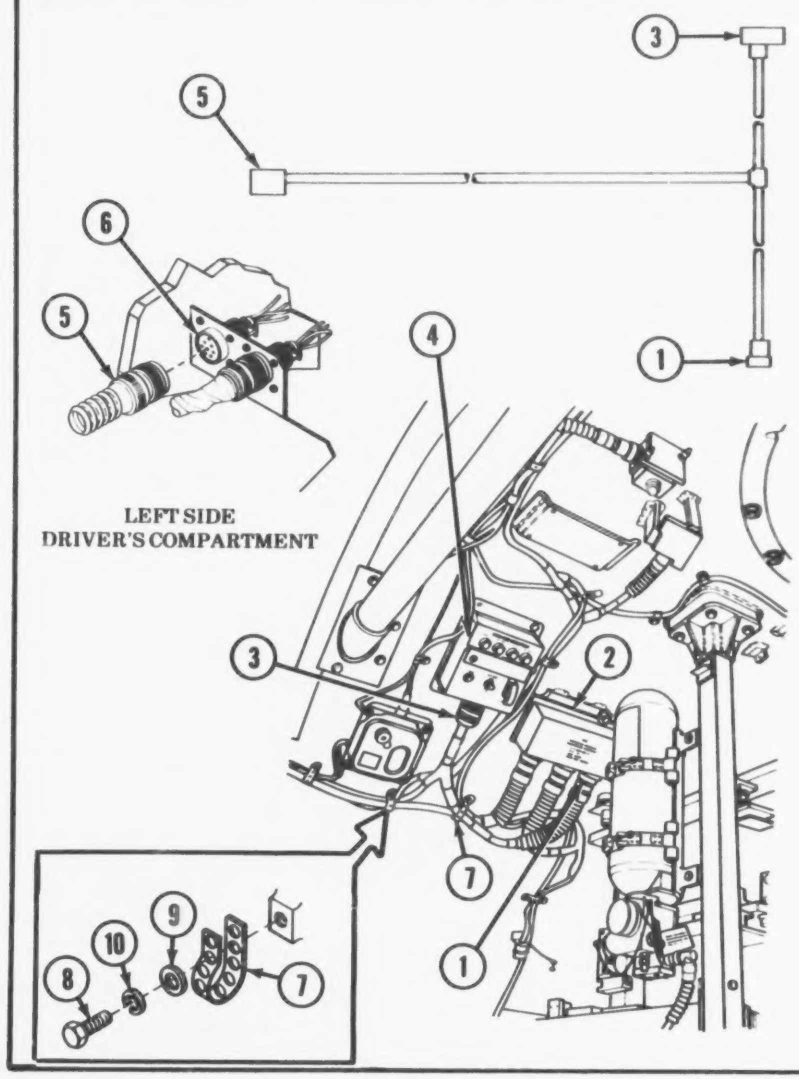
A Attach SCEA unit (1) to hull using two screws (2) and two new lockwashers (3). Tighten securely.

B Connect three wiring harness plugs (4) to SCEA unit (1).

WARNING

Turn crew T/A panel MAINTenance switch to horizontal position. Remove locking pins from valve actuator guards of crew extinguisher cylinder bottles no. 3 and no. 4. Remove anti-recoil plugs from discharge port of each crew compartment cylinder bottle and replace with dispersion nozzles.

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION



INITIAL SET UP

Equipment Condition:

Right and left projectile racks removed (p 11-5).
Crew AFES deactivated (p 14-14.7).

HARNESS 12351498: REMOVAL

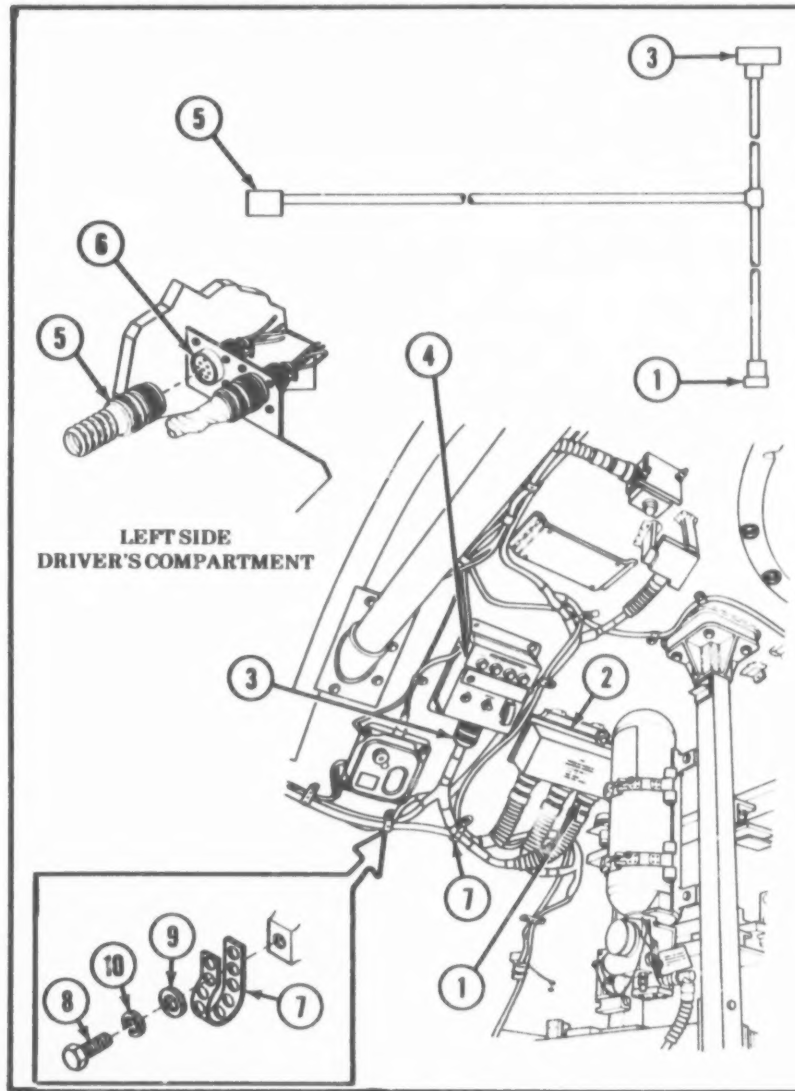
A Disconnect harness plug (1) from SCEA unit (2).

B Disconnect harness plug (3) from crew T/A panel (4).

C Disconnect harness plug (5) from connector (6) of harness 12351461.

D From each of 24 strap assemblies (7) remove one screw (8), one flat washer (9) and one lockwasher (10). Separate and remove wiring harness 12351498 from other harnesses. Secure remaining harnesses by reinstalling strap assemblies.

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)



HARNESS 12351498: INSTALLATION

A Install wiring harness 12351498 and others by attaching 24 strap assemblies (7) to bulkhead. With each assembly, use one screw (8), one flat washer (9) and one new lockwasher (10).

B Connect harness plug (5) to wiring harness 12351461.

C Connect harness plug (3) to crew T/A panel (4).

D Connect harness plug (1) to SCEA unit (2).

E Reactivate crew AFES (p 14-14.8).

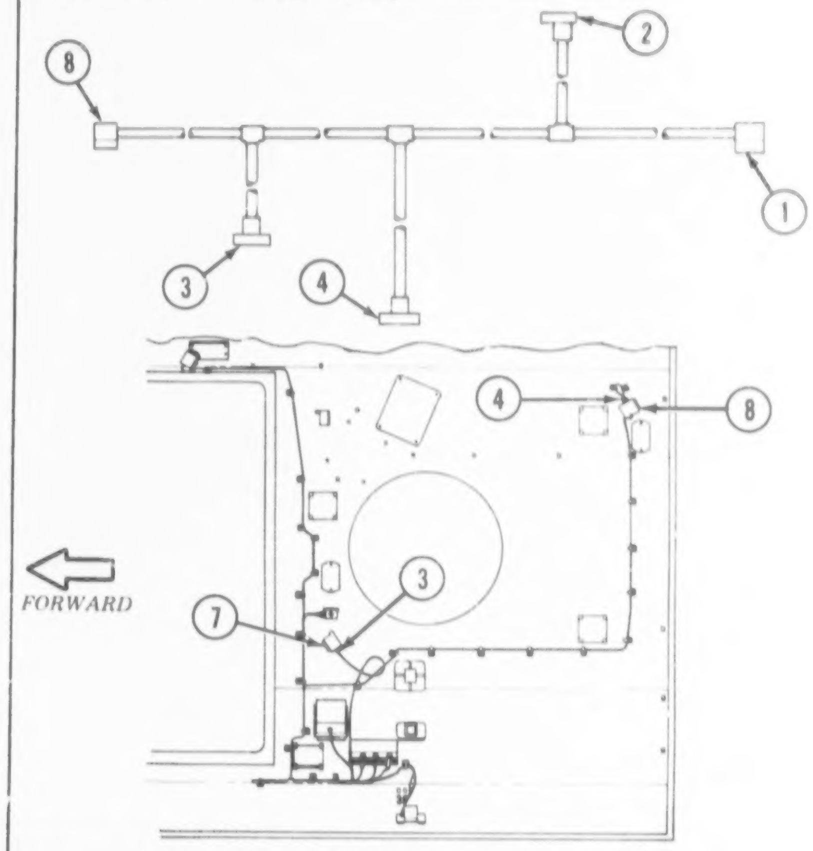
F Replace right and left projectile racks (p 11-5).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

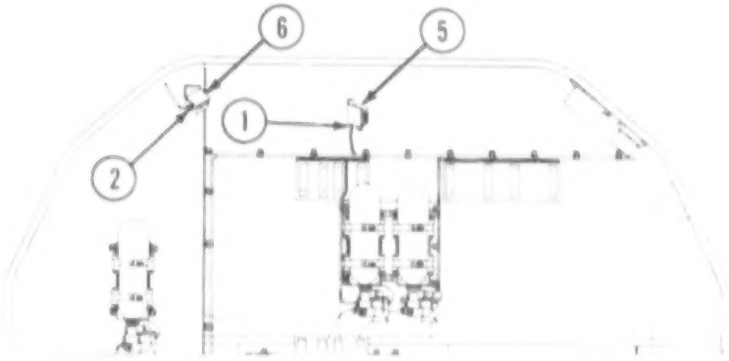
INITIAL SET UP

Equipment Condition:

Crew AFES deactivated (p 14-14.7).
Crew compartment top doors open (TM 9-2350-267-10).



IN VEHICLE LOOKING UP - CREW COMPARTMENT

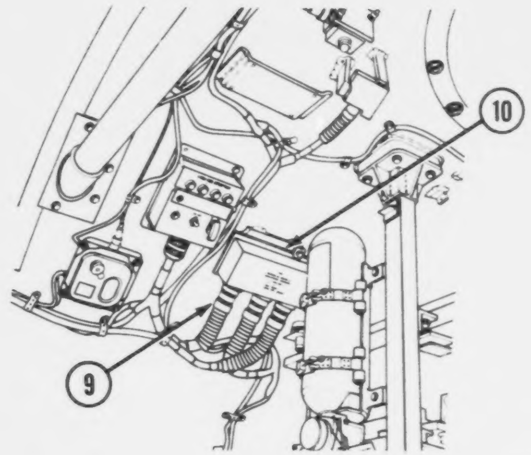


FORWARD BULKHEAD — CREW COMPARTMENT

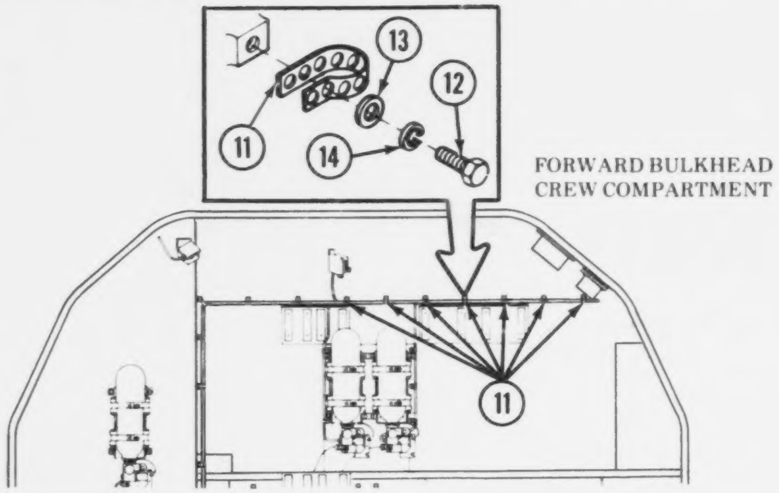
HARNESS 12351499: REMOVAL

A Disconnect harness plugs (1, 2, 3 and 4) from four OFSA units (5, 6, 7 and 8).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)



B Disconnect harness plug (9) from SCEA unit (10).



C From each of seven strap assemblies (11) remove one screw (12), one flat washer (13) and one lockwasher (14). Separate and remove wiring harness 12351499 from other harnesses. Secure remaining harnesses by reinstalling straps (11), screws (12), flat washers (13) and lockwashers (14).

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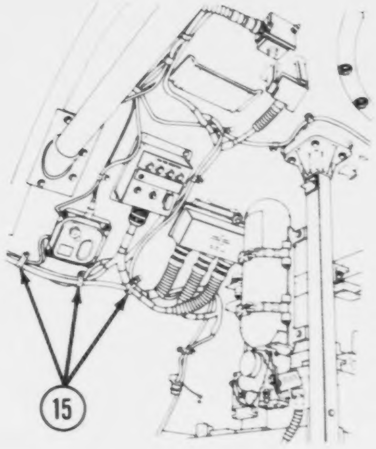
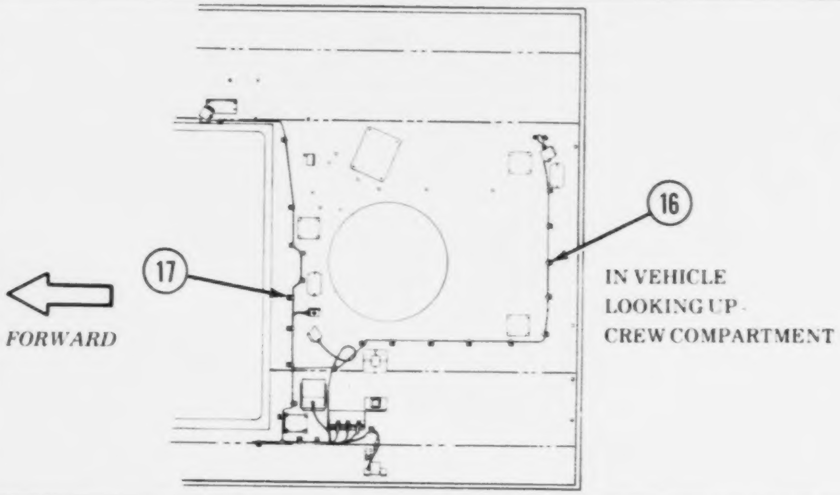
CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)



D Remove wiring harness 12351499 from 10 strap assemblies (15).

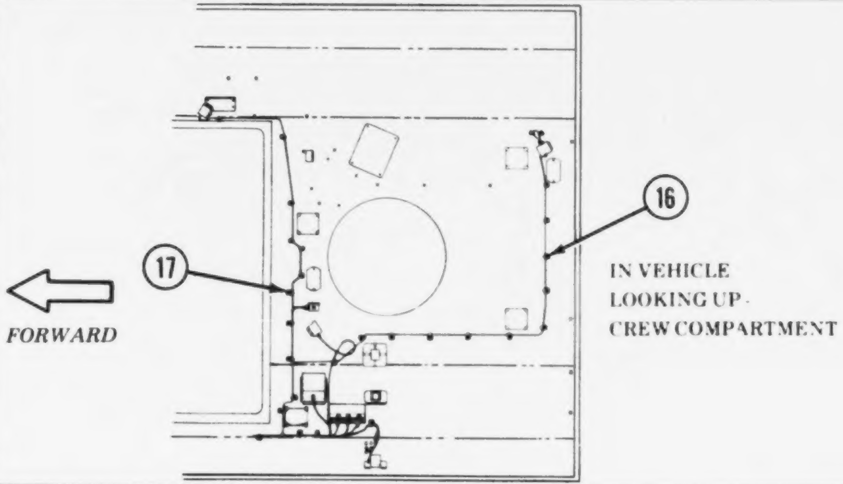

16
17
FORWARD
IN VEHICLE
LOOKING UP -
CREW COMPARTMENT

E Remove wiring harness 12351499 from 12 strap assemblies (16).

F Remove wiring harness 12351499 from 12 strap assemblies (17).

G Remove harness from vehicle.

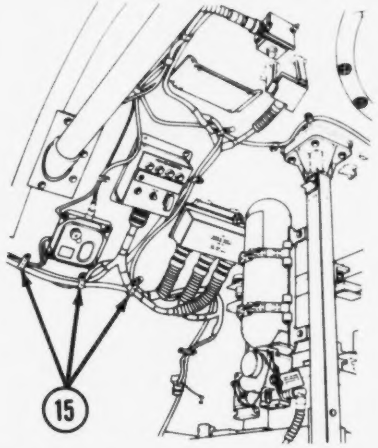
CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)


16
17
FORWARD
IN VEHICLE
LOOKING UP -
CREW COMPARTMENT

HARNESS 12351499: INSTALLATION

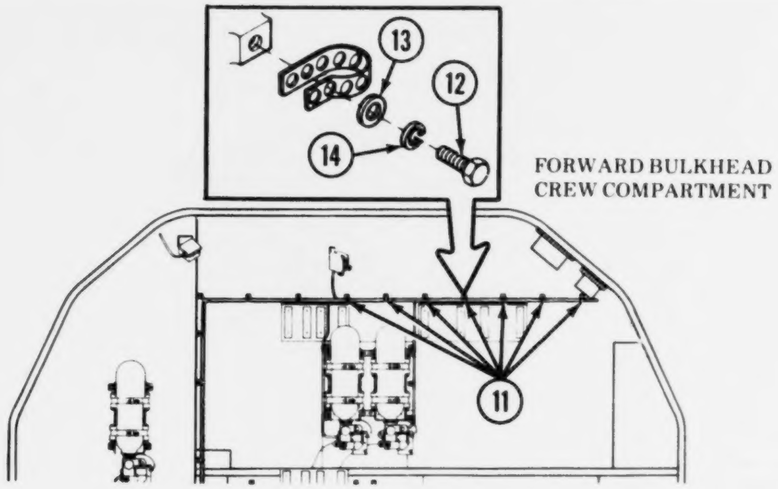
A Install wiring harness 12351499 using 12 strap assemblies (17).

B Install wiring harness 12351499 using 12 strap assemblies (16).

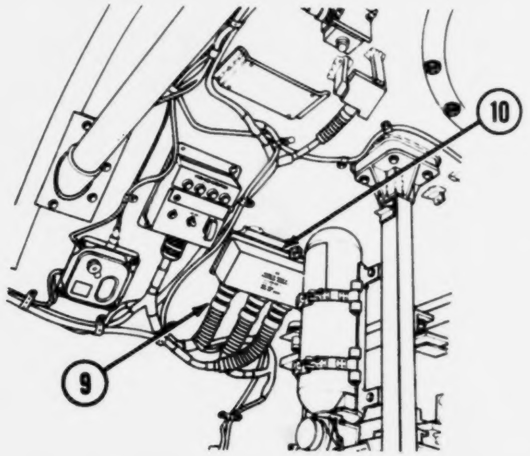


C Install wiring harness 12351499 using 10 strap assemblies (15).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

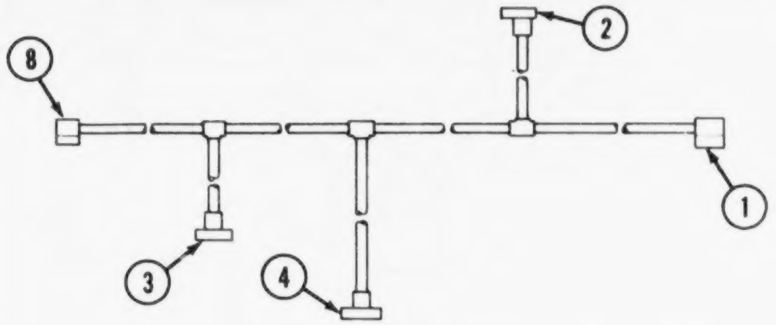

13
12
14
FORWARD BULKHEAD
CREW COMPARTMENT
11

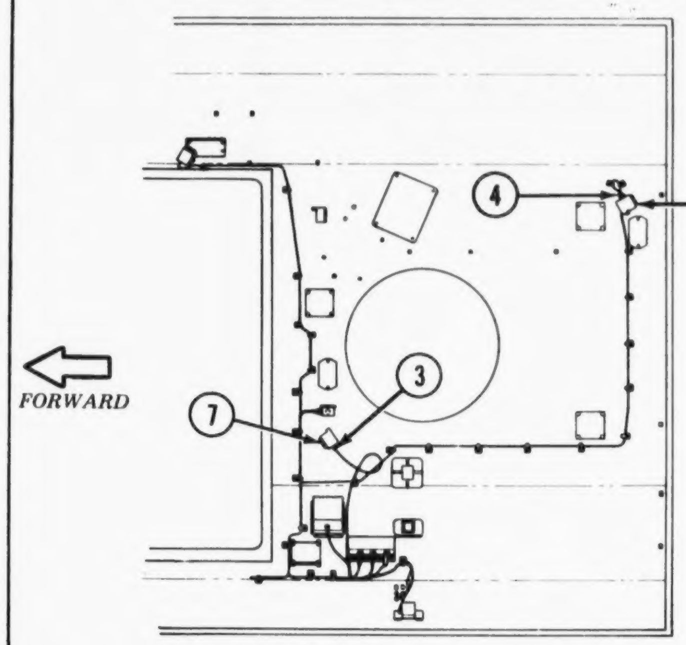
D Secure wiring harness 12351499 and other wiring harnesses by attaching seven strap assemblies to bulkhead. With each assembly, use one screw (12), one new lockwasher (14) and one flat washer (13).



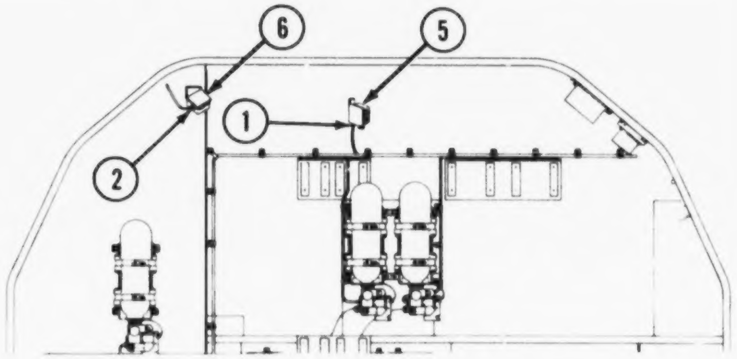
E Connect harness plug (9) to SCEA unit (10).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)





IN VEHICLE LOOKING UP - CREW COMPARTMENT



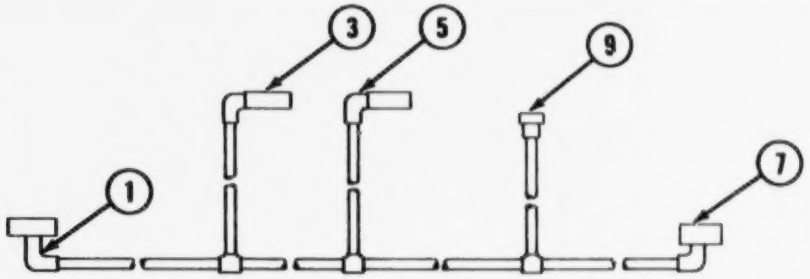
FORWARD BULKHEAD – CREW COMPARTMENT

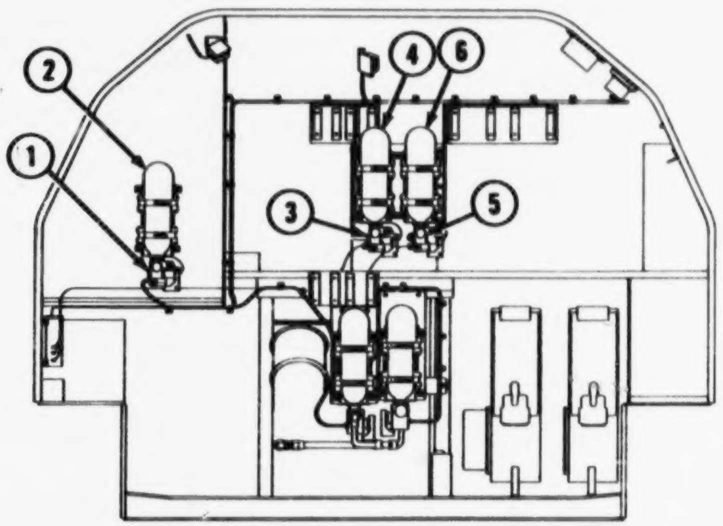
F Connect harness plugs (1, 2, 3 and 4) to four OFSA units (5, 6, 7 and 8).

G Close crew compartment top doors (TM 9-2350-267-10).

H Reactivate crew AFES (p 14-14.7).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)





FORWARD BULKHEAD—CREW COMPARTMENT

INITIAL SET UP

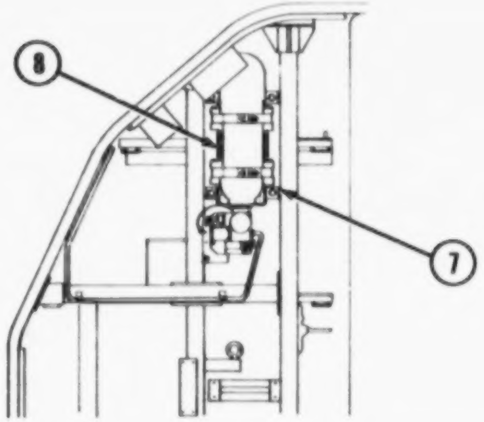
Equipment Condition:

Right and left projectile racks removed (p 11-5).
Crew AFES deactivated (p 14-14.7).
Extinguisher bottles and brackets no. 1 and no. 4 removed (p 14-28.3).

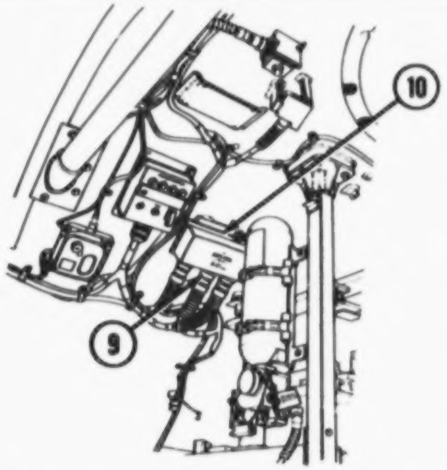
HARNESS 12351501: REMOVAL

A Disconnect electrical harness connector (1) from actuator of crew compartment fire extinguisher no. 3 (2).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

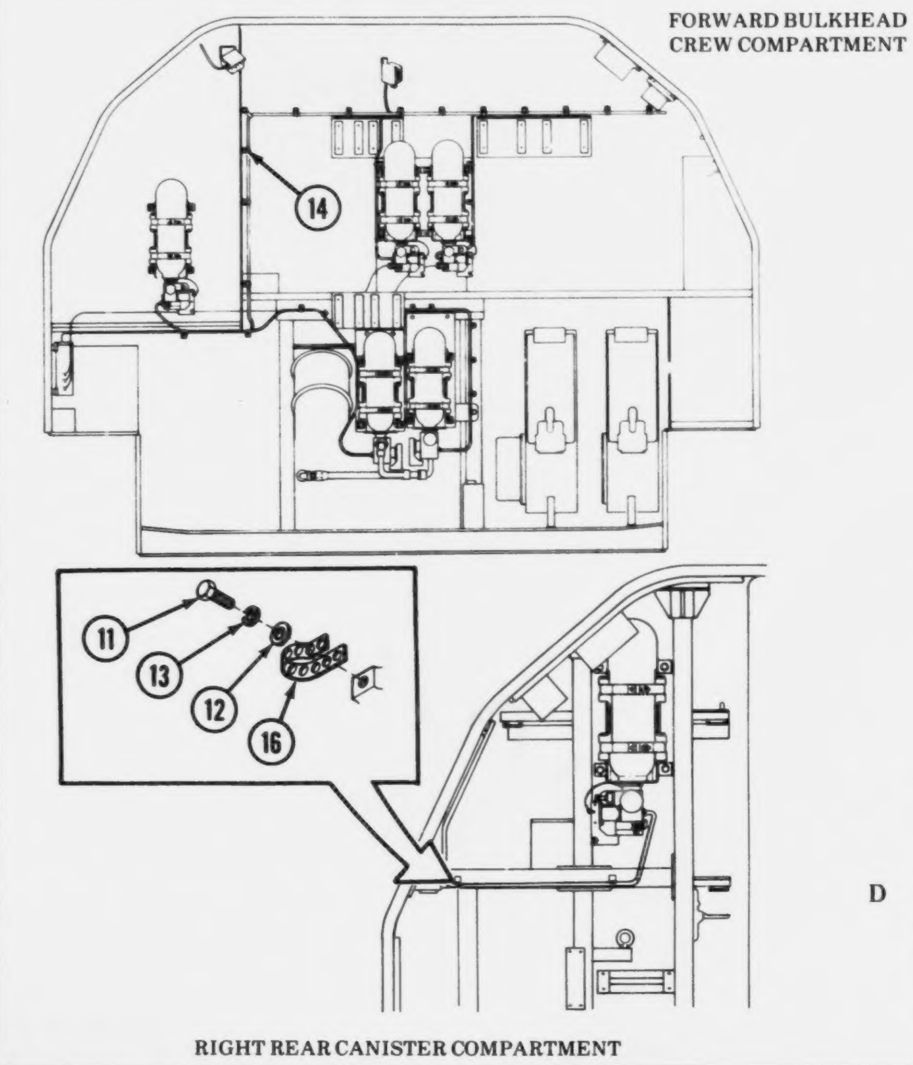


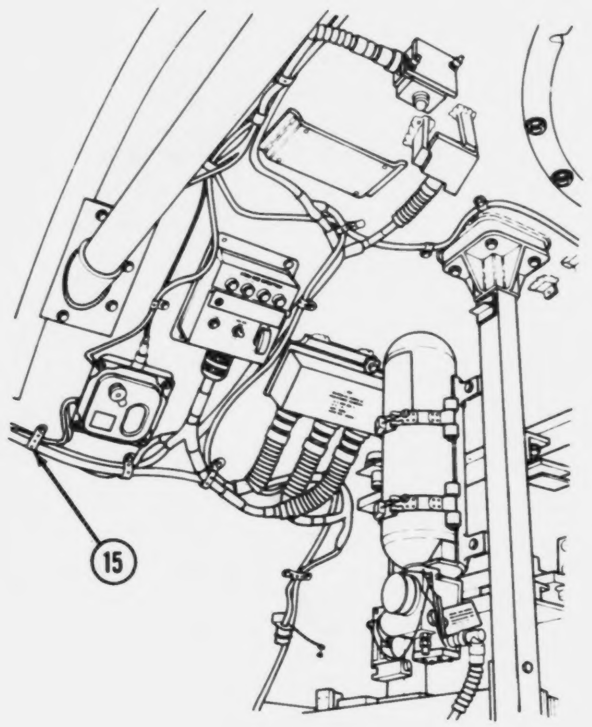
B Disconnect electrical harness connector (7) from actuator of crew compartment fire extinguisher no. 2 (8).



C Disconnect connector (9) from SCEA (10).

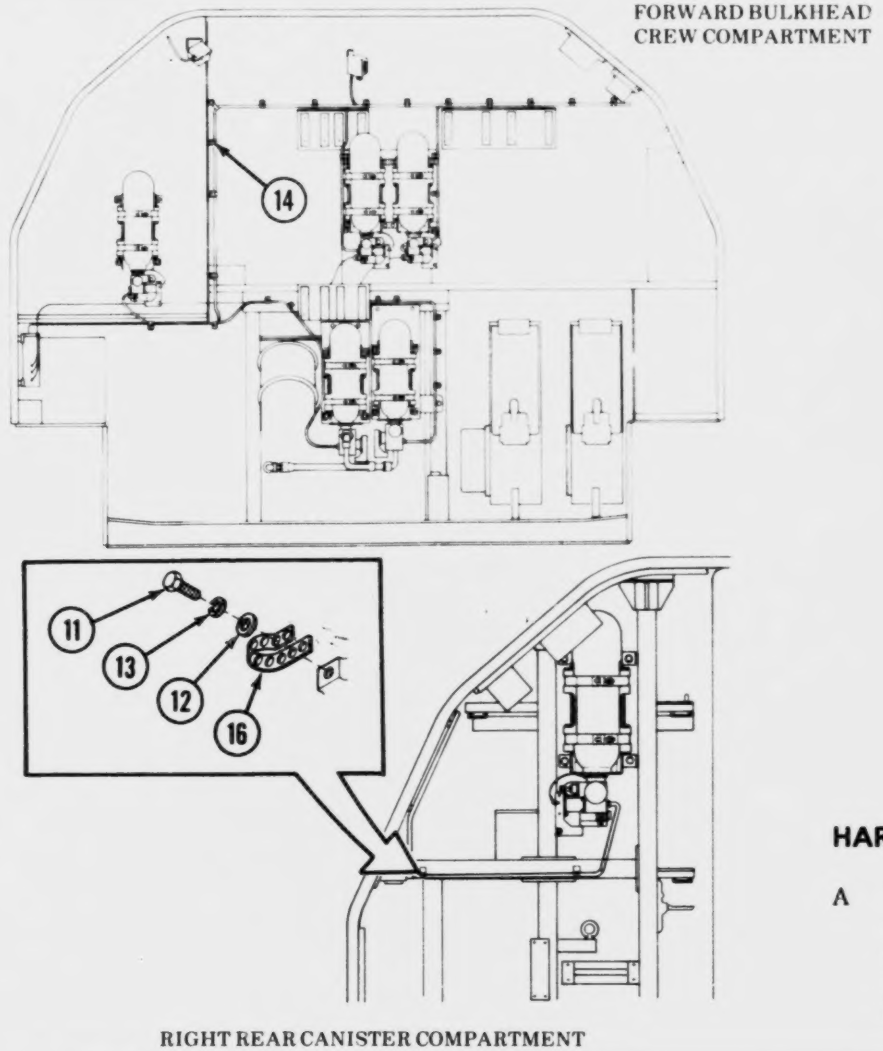
CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

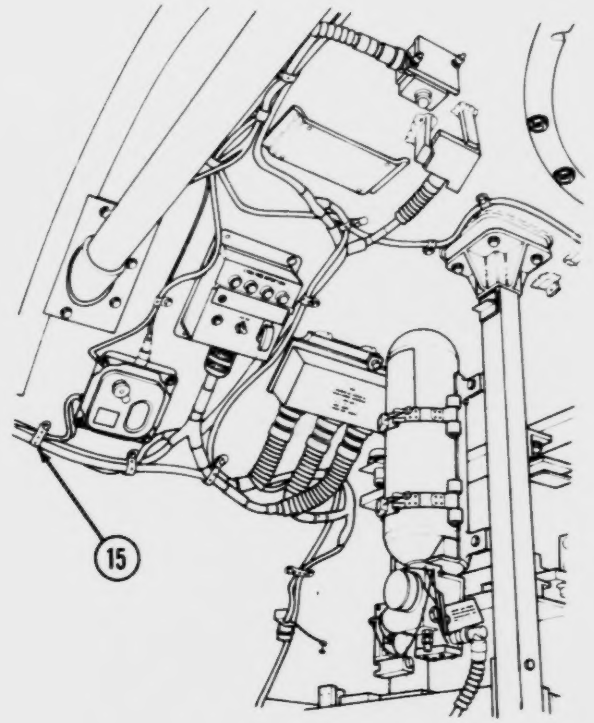

FORWARD BULKHEAD
CREW COMPARTMENT
14
11
13
12
16
RIGHT REAR CANISTER COMPARTMENT



D Remove screw (11), flat washer (12) and lockwasher (13) from each of 14 strap assemblies (14), 12 strap assemblies (15) and two strap assemblies (16). Remove only electrical harness 12351501 from strap assemblies. Keep remaining harnesses strapped to cargo compartment bulkhead.

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

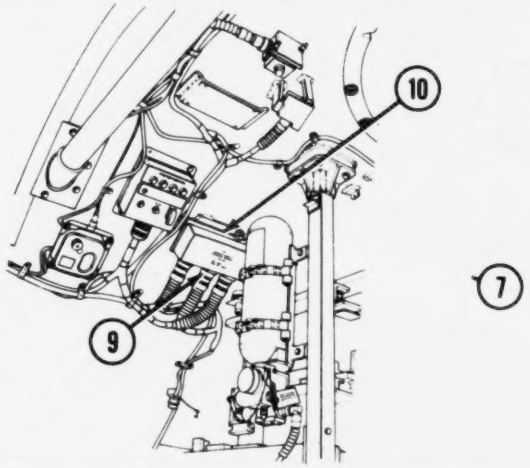

FORWARD BULKHEAD
CREW COMPARTMENT
14
11
13
12
16
RIGHT REAR CANISTER COMPARTMENT



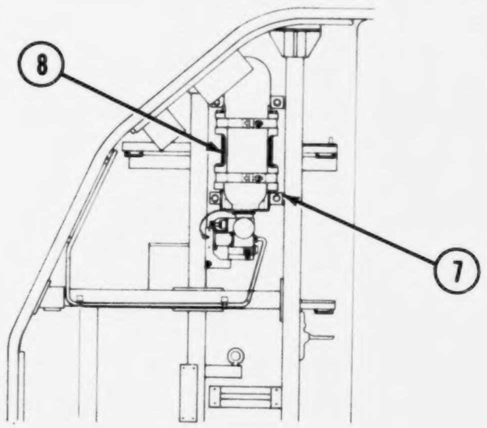
HARNESS 12351501: INSTALLATION

A Attach wiring harness 12351501 and others to bulkhead using 14 strap assemblies (14), 12 strap assemblies (15) and two strap assemblies (16). Install each strap assembly using one screw (11), one new lockwasher (13) and one flat washer (12).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

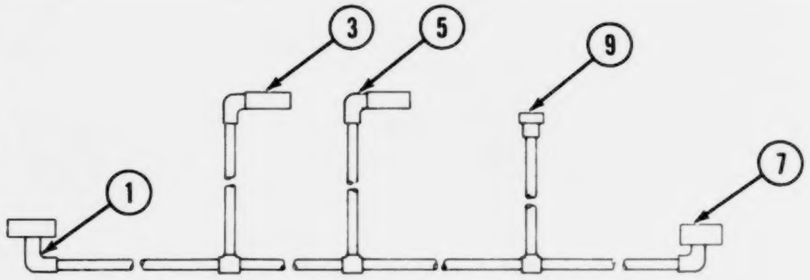


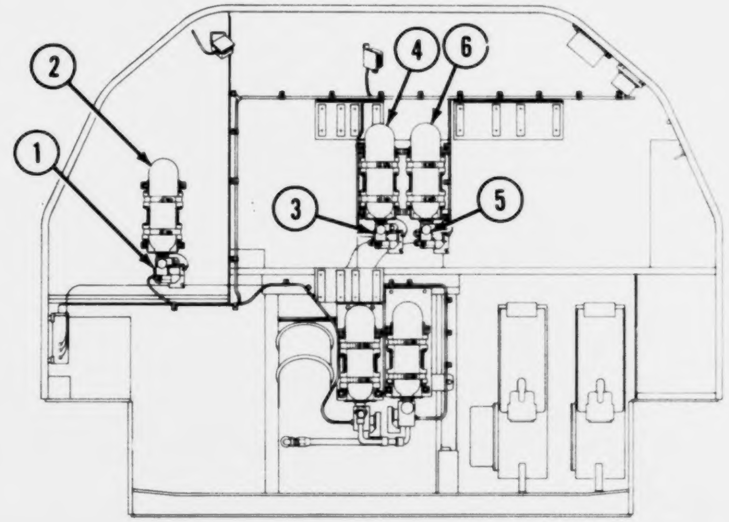
B Connect connector (9) to SCEA (10).



C Connect electrical harness connector (7) to actuator of crew compartment fire extinguisher no. 2 (8).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)





IN VEHICLE LOOKING UP - CREW COMPARTMENT

D Connect electrical harness connector (1) to actuator of crew compartment fire extinguisher no. 3 (2).

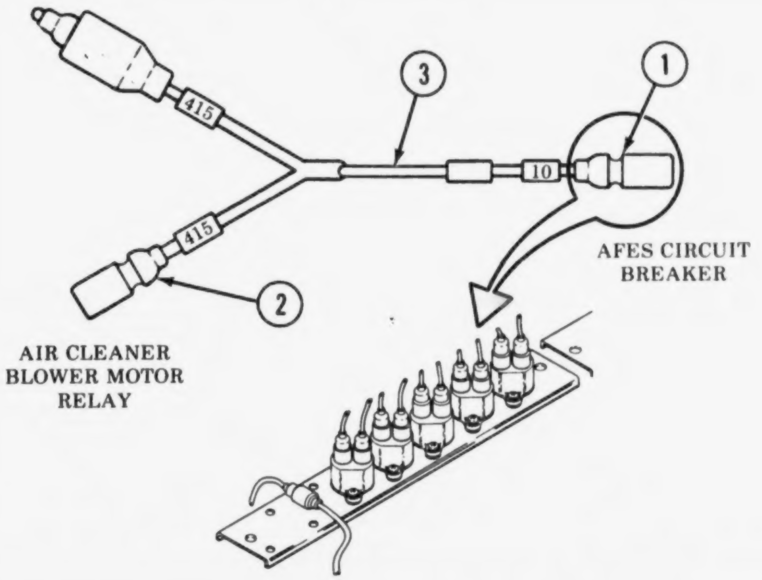
CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

E Install extinguisher bottles and brackets no. 1 and no. 4 (p 14-28.3).

F Reactivate crew AFES (p 14-14.7).

G Install right and left projectile racks (p 11-5).



CABLE 12351754: REMOVAL

A Disconnect cable lead no. 10 (1) from no. 6 circuit breaker of panel no. 2.

B Disconnect cable lead no. 415 (2) from air cleaner blower motor relay.

C Remove cable 12351754 (3) from vehicle.

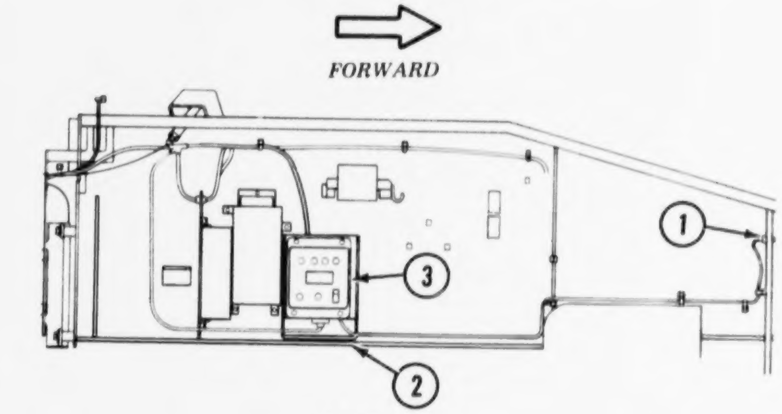
INSTALLATION

A Install cable 12351754 (3) in vehicle.

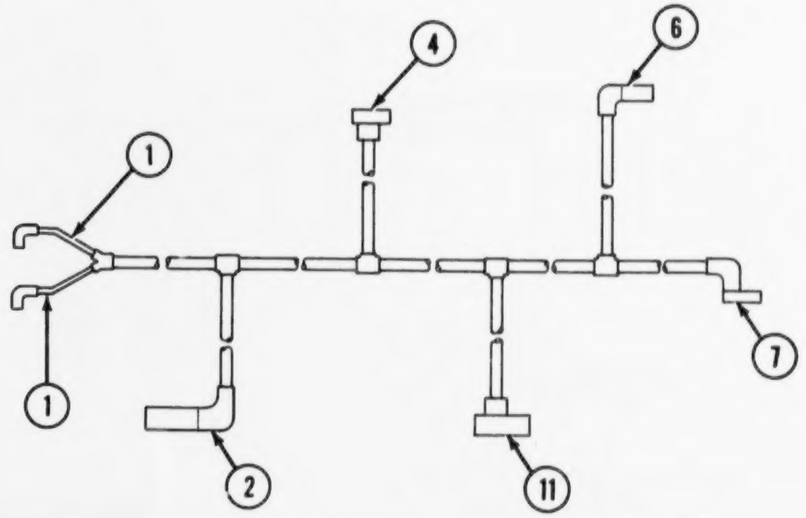
B Connect cable lead no. 415 (2) to air cleaner blower motor.

C Connect cable lead no. 10 (1) to no. 6 on circuit breaker of panel no. 2.

■ ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION



LEFT SIDE
DRIVER'S COMPARTMENT



INITIAL SET UP

Equipment Condition:

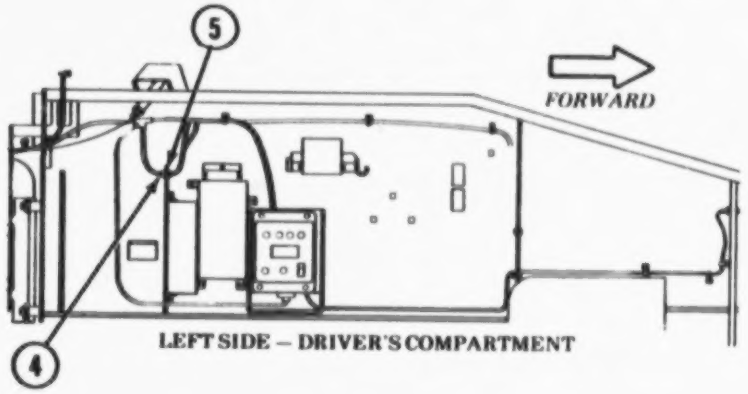
Engine AFES deactivated (p 14-14.3).
Left projectile rack removed (p 11-5).
Engine compartment extinguisher bottle brackets removed (p 14-30.1).

HARNESS 12351500: REMOVAL

A Disconnect harness plugs (1) from driver's compartment forward bulkhead.

B Disconnect harness plug (2) from engine T/A panel (3).

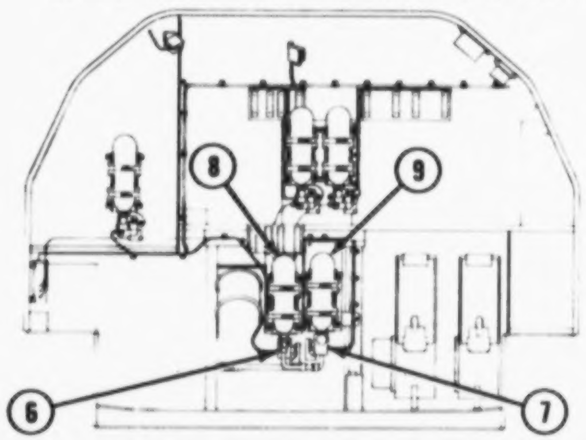
ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE – DRIVER'S COMPARTMENT

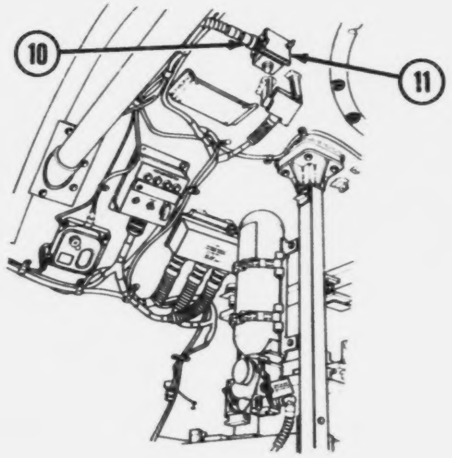
C Disconnect harness plug (4) from harness 12351461 connector (5).

FORWARD BULKHEAD – CREW COMPARTMENT

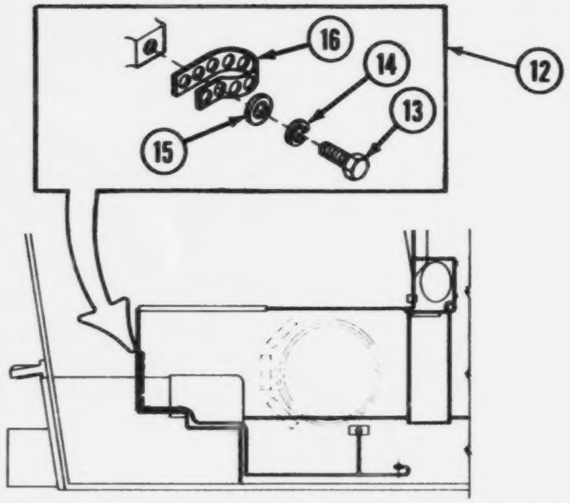


D Disconnect harness plugs (6 and 7) from actuator of engine fire extinguisher bottles no. 1 (8) and no. 2 (9).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

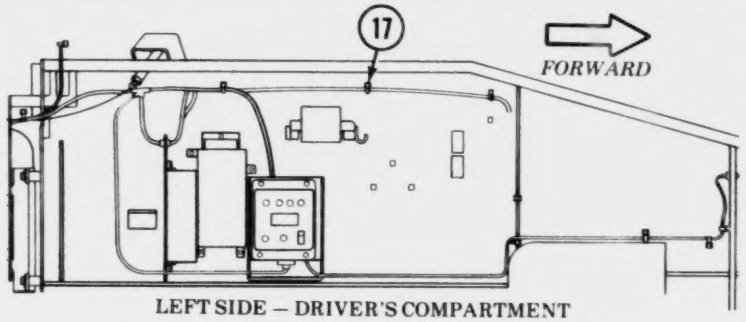


E Disconnect harness plug (10) from RSI (11).

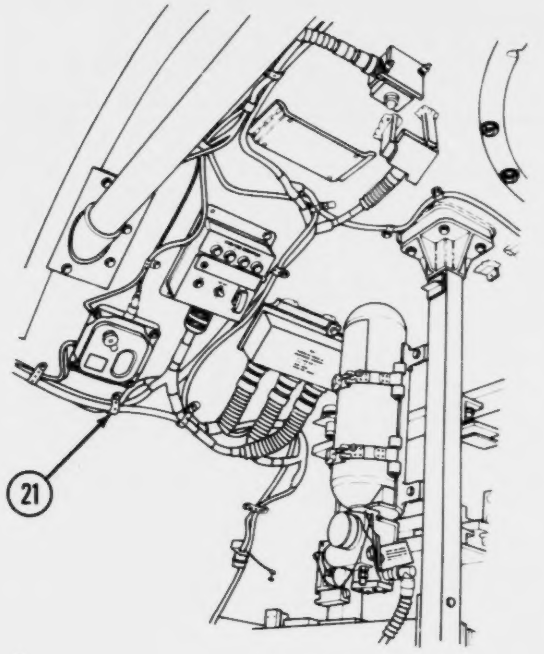


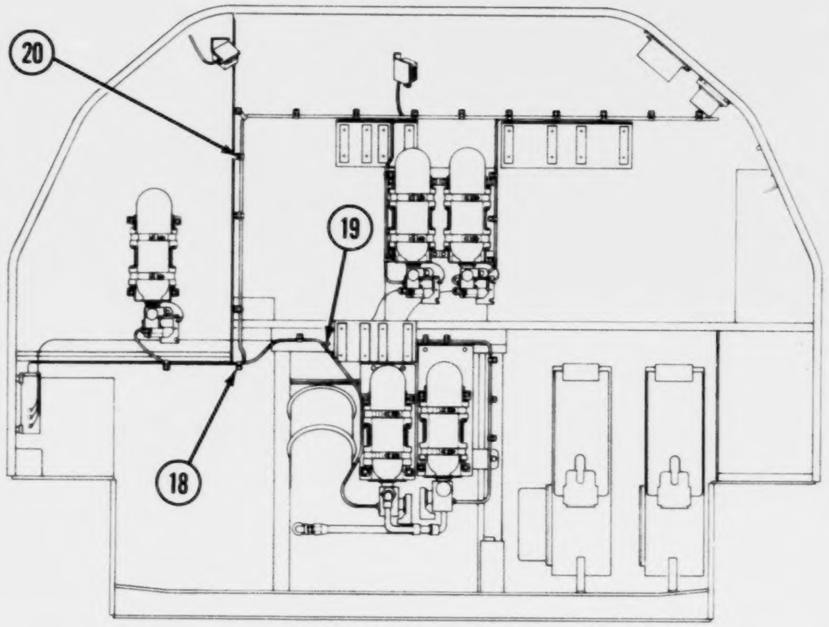
F Remove nine strap assemblies (12) by removing from each: one screw (13), one lockwasher (14), one flat washer (15) and one strap (16). Remove harness 12351500. Install strap assemblies.

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE – DRIVER'S COMPARTMENT

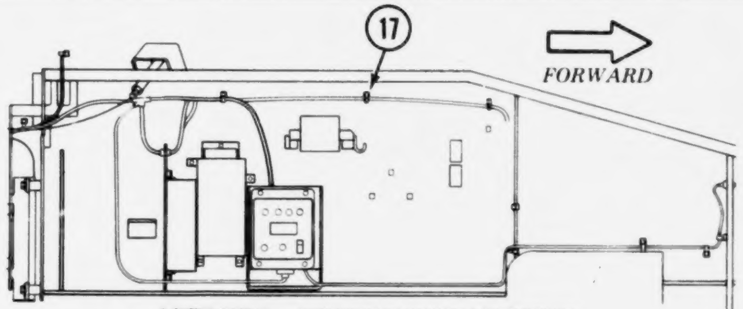




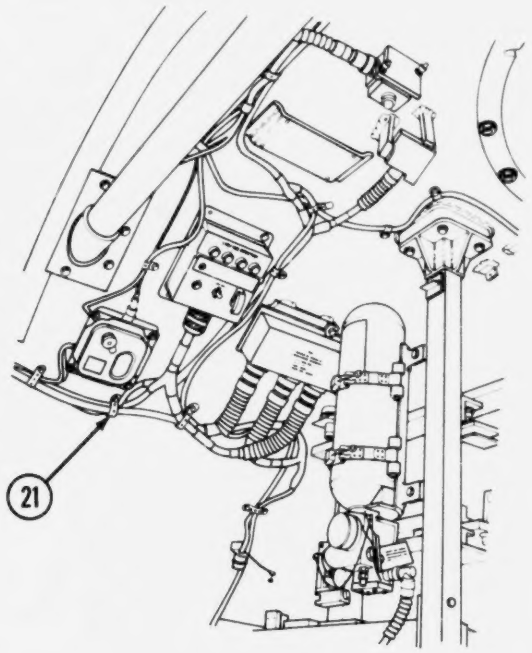
FORWARD BULKHEAD
CREW COMPARTMENT

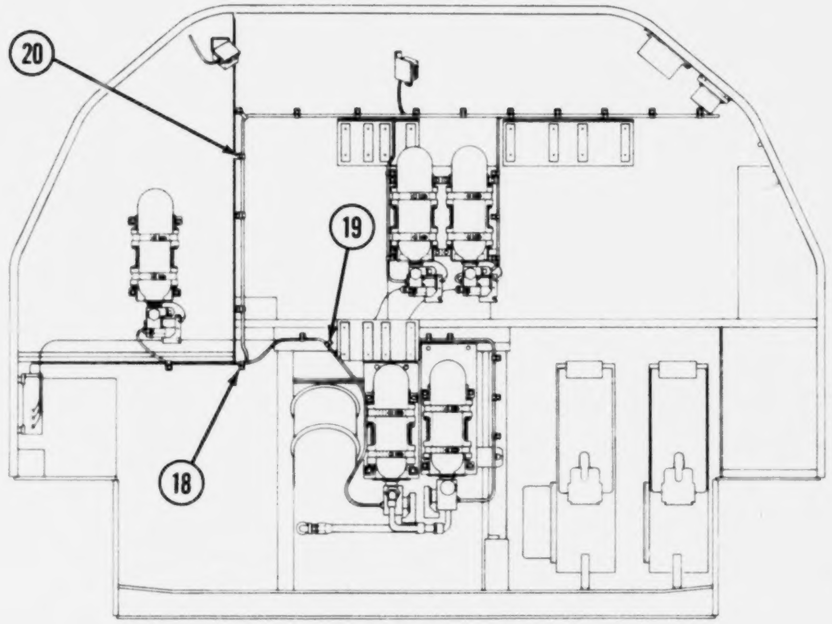
G Remove four strap assemblies (17), strap assembly (18), seven strap assemblies (19), 13 strap assemblies (20) and 12 strap assemblies (21). Separate harness 12351500 from other harnesses and remove from vehicle. Reinstall each strap assembly after harness is removed.

ENGINE AFES ELECTRICAL WIRING HARNESS (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE – DRIVER'S COMPARTMENT



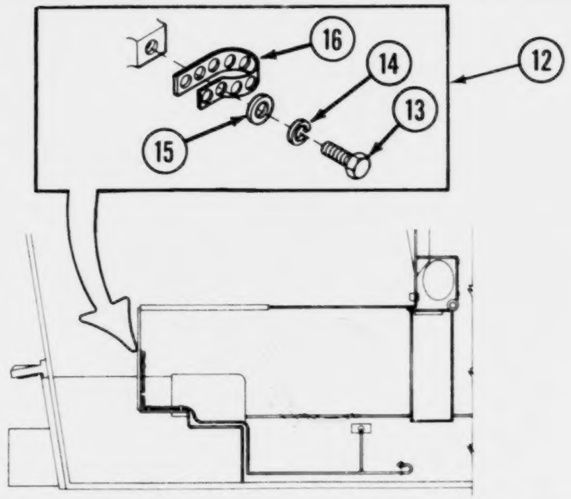


FORWARD BULKHEAD
CREW COMPARTMENT

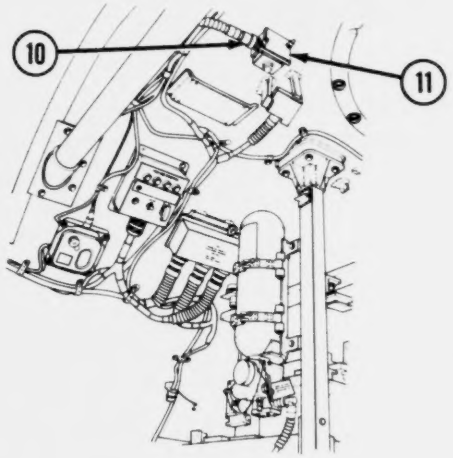
HARNESS 12351500: INSTALLATION

A Attach harness 12351500 and other harnesses to vehicle using four strap assemblies (17), strap assembly (18), seven strap assemblies (19), 13 strap assemblies (20) and 12 strap assemblies (21). Install each strap assembly using one screw, one new lockwasher and one flat washer.

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

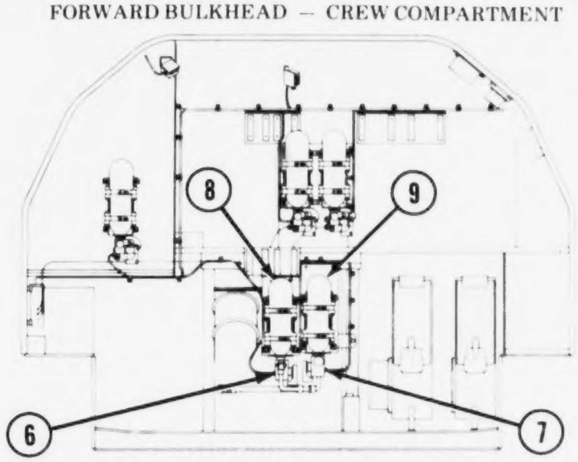


B Attach harness 12351500 to bulkhead with nine strap assemblies (12), each using one screw (13), one new lockwasher (14), one flat washer (15) and one strap (16).

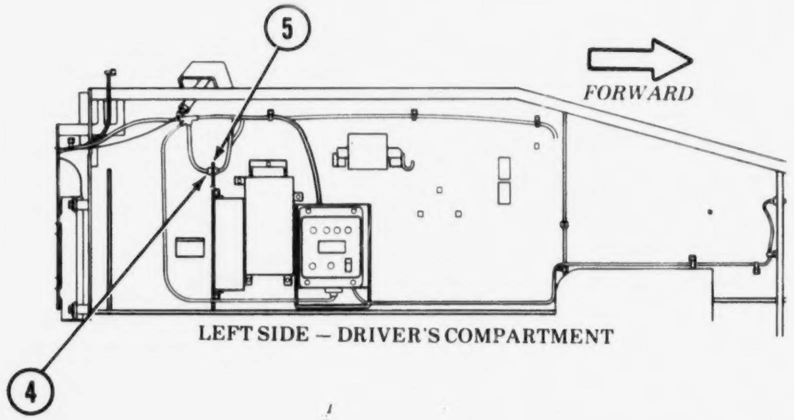


C Connect harness plug (10) to RSI (11).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)

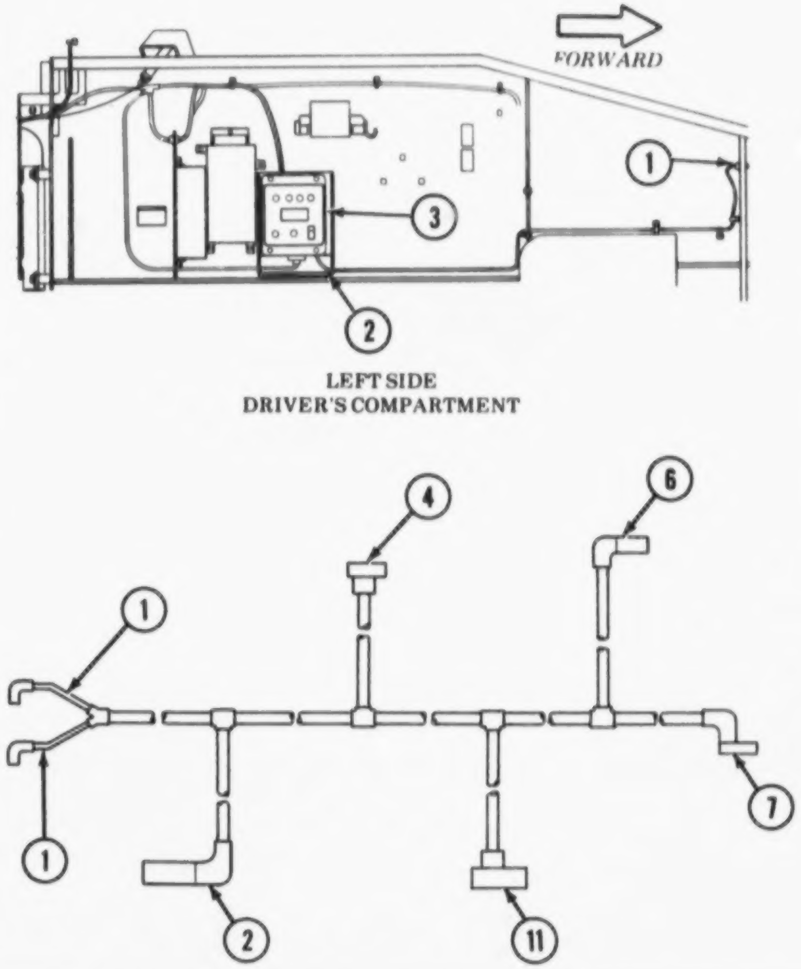

FORWARD BULKHEAD — CREW COMPARTMENT
8
9
6
7

D Connect harness plugs (6 and 7) to valve actuators of engine fire extinguisher bottles no. 1 (8) and no. 2 (9).


5
FORWARD
LEFT SIDE – DRIVER'S COMPARTMENT
4

E Connect harness plug (4) to harness 12351461 connector (5).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 1 THRU 344): REMOVAL AND INSTALLATION (CONTINUED)


FORWARD
1
3
2
LEFT SIDE
DRIVER'S COMPARTMENT
4
6
1
1
2
11
7

F Connect harness plug (2) to engine T/A panel (3).

G Connect harness plugs (1) to driver's compartment forward bulkhead.

H Install engine compartment extinguisher bottle brackets (p 14-30.1).

I Install left projectile rack (p 11-5).

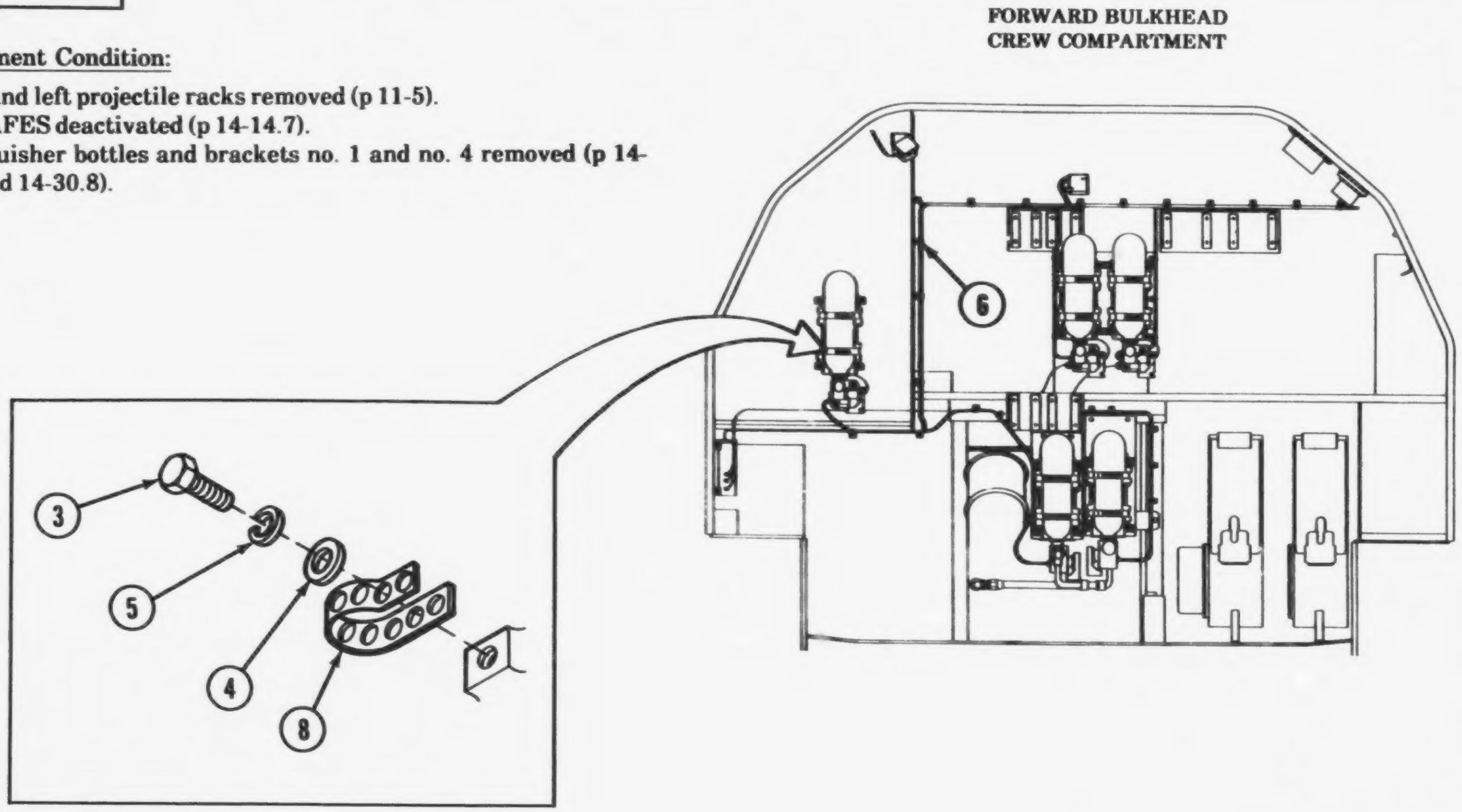
J Reactivate engine AFES (p 14-14.3).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION

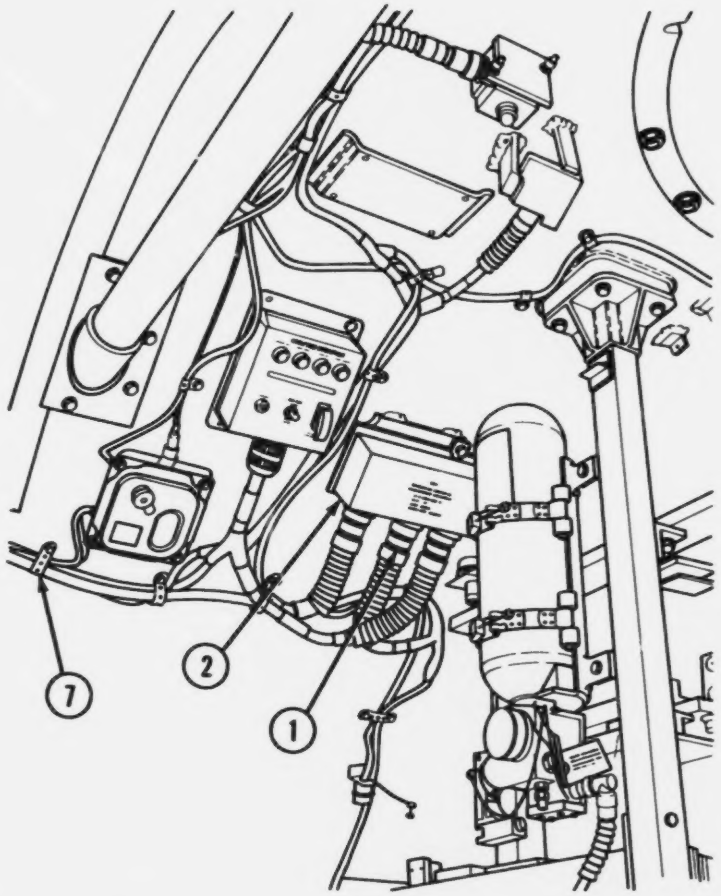
INITIAL SETUP

Equipment Condition:

Right and left projectile racks removed (p 11-5).
Crew AFES deactivated (p 14-14.7).
Extinguisher bottles and brackets no. 1 and no. 4 removed (p 14-28.9 and 14-30.8).


FORWARD BULKHEAD
CREW COMPARTMENT
6
3
5
4
8

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



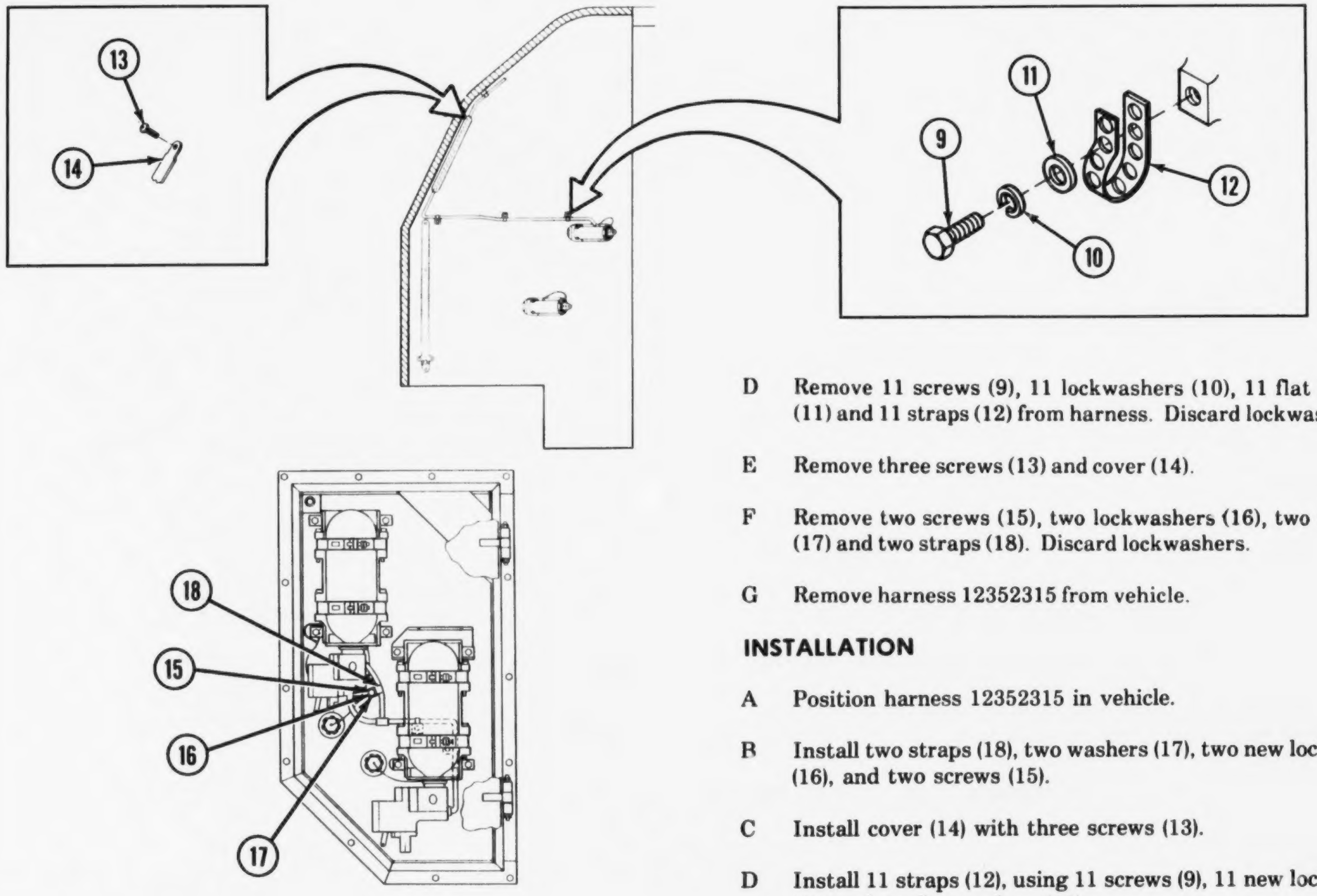
HARNESS 12352315: REMOVAL

A Disconnect electrical harness connector from valve actuator of crew compartment fire extinguisher nos. 2, 3, 5 and 6.

B Disconnect connector (1) form SCEA (2).

C Remove screw (3), flat washer (4) and lockwasher (5) from each of 14 straps (6), 12 straps (7) and two straps (8). Discard lockwashers.

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



D Remove 11 screws (9), 11 lockwashers (10), 11 flat washers (11) and 11 straps (12) from harness. Discard lockwashers.

E Remove three screws (13) and cover (14).

F Remove two screws (15), two lockwashers (16), two washers (17) and two straps (18). Discard lockwashers.

G Remove harness 12352315 from vehicle.

INSTALLATION

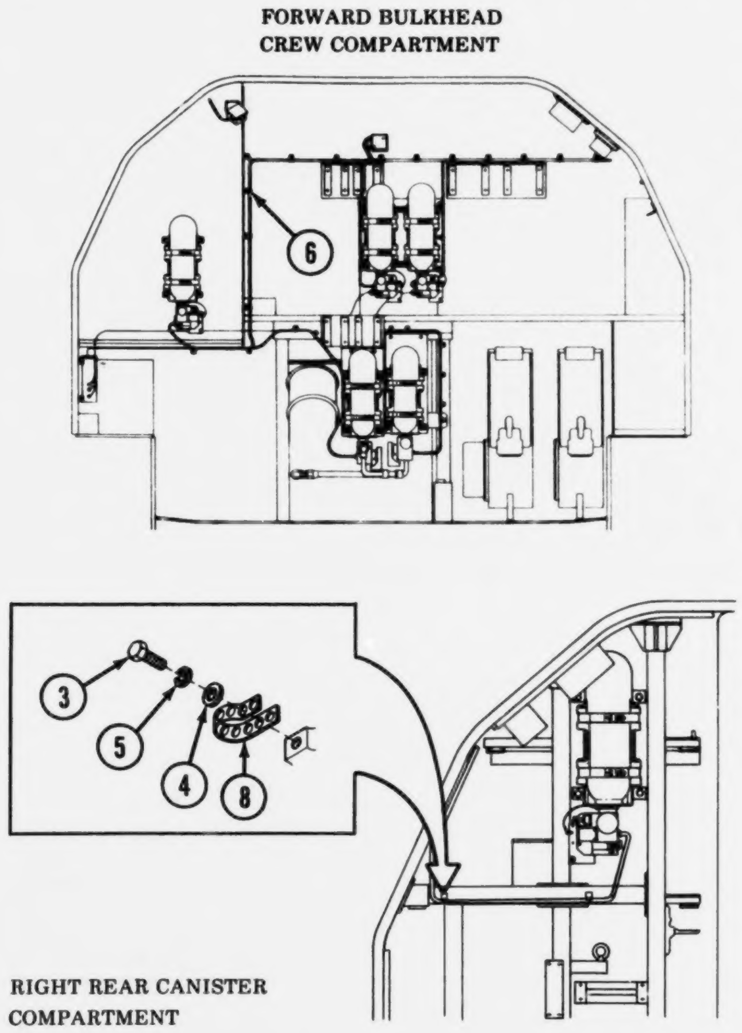
A Position harness 12352315 in vehicle.

B Install two straps (18), two washers (17), two new lockwashers (16), and two screws (15).

C Install cover (14) with three screws (13).

D Install 11 straps (12), using 11 screws (9), 11 new lockwashers (10) and 11 flat washers (11).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)


FORWARD BULKHEAD
CREW COMPARTMENT
6
3
5
4
8
RIGHT REAR CANISTER
COMPARTMENT

E Install 14 straps (6), 12 straps (7) and two straps (8) using one screw (3), one flat washer (4) and one new lockwasher (5).

F Connect connector (1) to SCEA (2).

G Connect connectors to fire extinguishers nos. 2, 3, 5 and 6.

H Install engine extinguisher bottles and brackets no. 1 and no. 4 (p 14-28.9 and 14-30.8).

I Reactivate crew AFES (p 14-14.7).

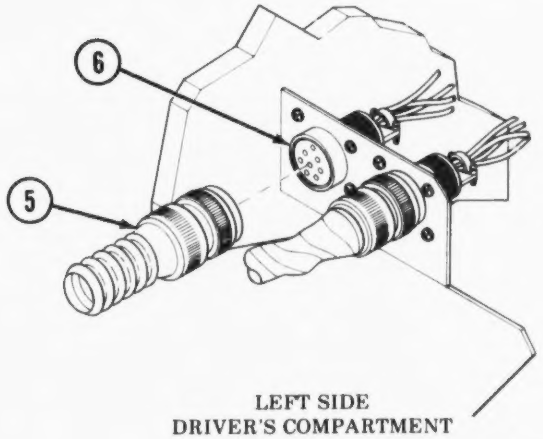
J Install right and left projectile racks (p 11-5).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

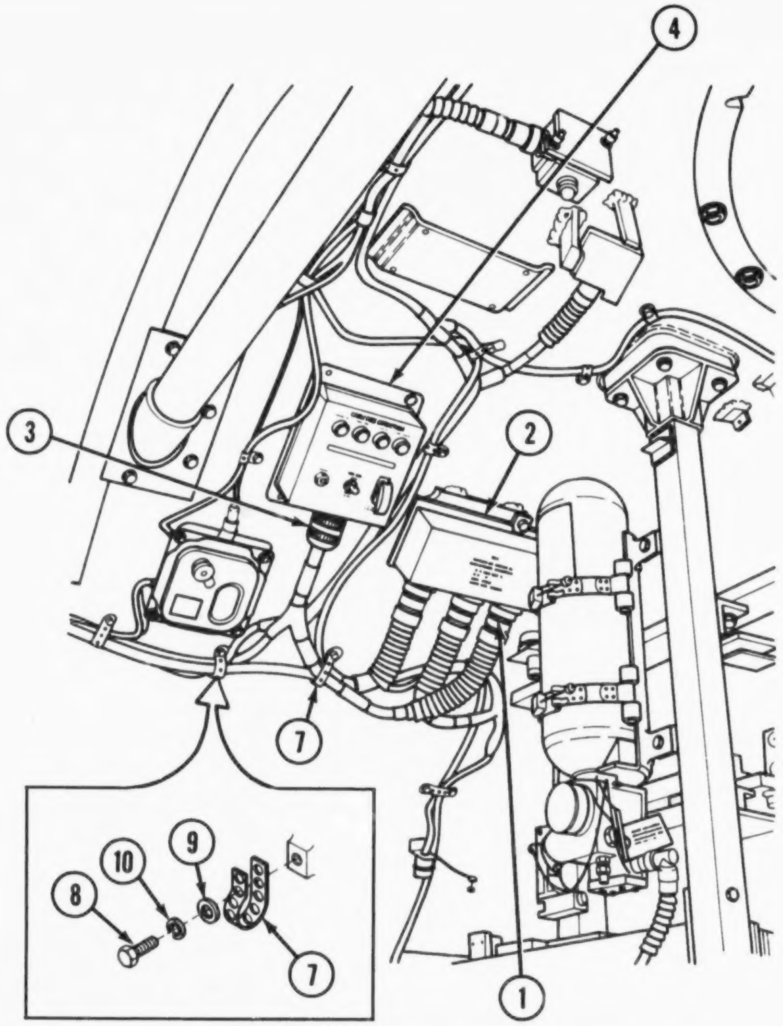
INITIAL SET UP

Equipment Condition:

Right and left projectile racks removed (p 11-5).
Crew AFES deactivated (p 14-14.7).



LEFT SIDE
DRIVER'S COMPARTMENT



CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

HARNESS 12352316: REMOVAL

A Disconnect harness plug (1) from SCEA unit (2).

B Disconnect harness plug (3) from crew T/A panel (4).

C Disconnect harness plug (5) from connector (6) of harness 12351461.

D From each of 25 strap assemblies (7) remove one screw (8), one flat washer (9) and one lockwasher (10). Discard lockwashers, separate and remove wiring harness 12352316 from other harnesses.

INSTALLATION

A Install wiring harness 12352316 on vehicle using 25 strap assemblies (7), 25 screws (8), 25 flat washers (9) and 25 new lockwashers (10).

B Connect harness plug (5) to connector (6) of harness 12351461.

C Connect harness plug (3) to crew T/A panel (4).

D Connect harness plug (1) to SCEA unit (2).

E Reactivate crew AFES (p 14-14.7).

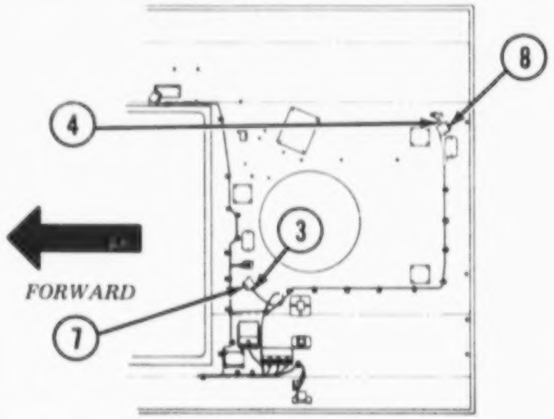
F Install right and left projectile racks (p 11-5).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

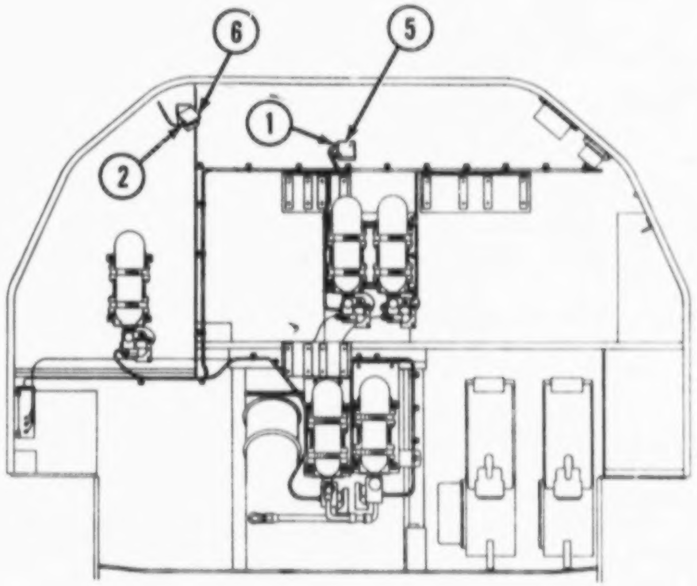
INITIAL SET UP

Equipment Condition:

Crew AFES deactivated (p 14-14.7).
Cargo compartment top doors open (TM 9-2350-267-10)



IN VEHICLE LOOKING UP - CREW COMPARTMENT

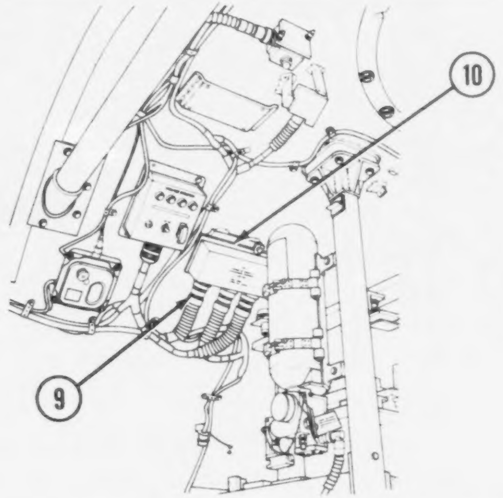


FORWARD BULKHEAD - CREW COMPARTMENT

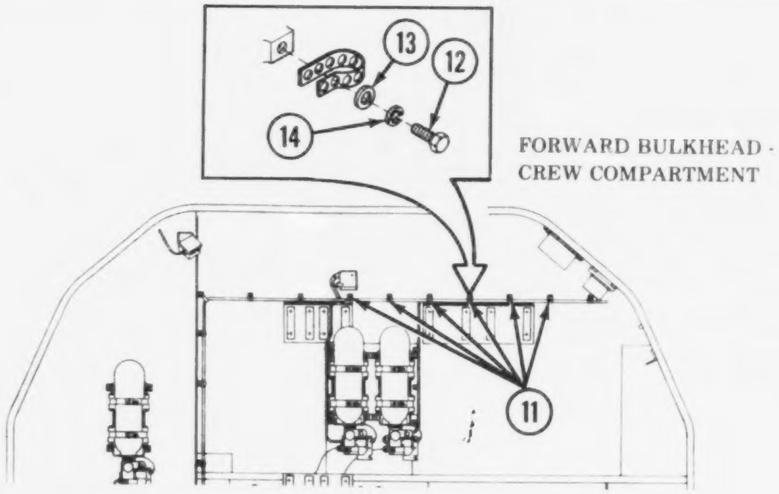
HARNESS 12352353: REMOVAL

A Disconnect harness plugs (1, 2, 3 and 4) from four OFSA units (5, 6, 7 and 8).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

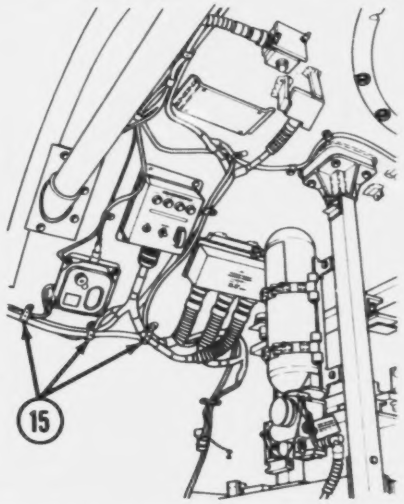


B Disconnect harness plug (9) from SCEA unit (10).

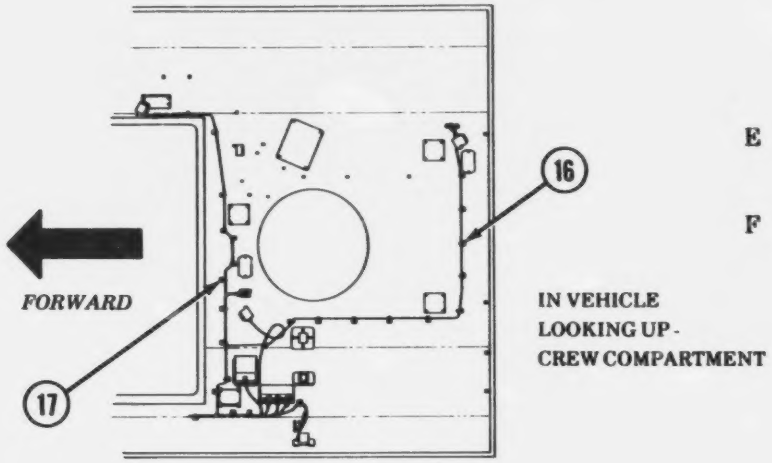

13
12
14
FORWARD BULKHEAD - CREW COMPARTMENT
11

C From each of six strap assemblies (11), remove one screw (12), one flat washer (13) and one lockwasher (14). Separate and remove wiring harness 12352353 from other harnesses. Discard lockwashers.

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



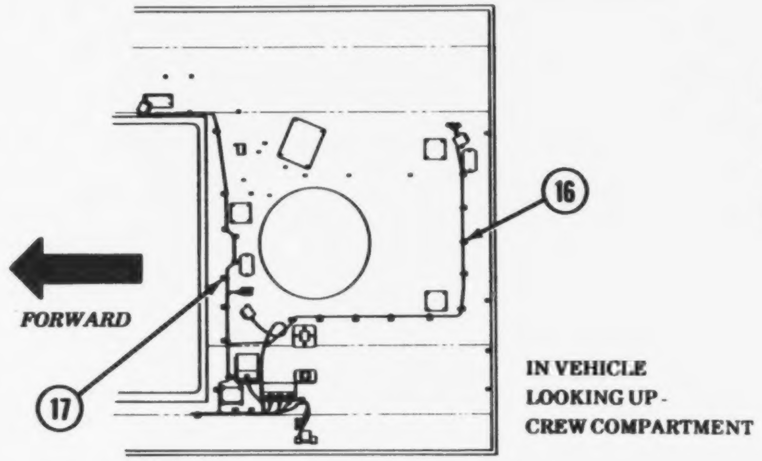
D Remove wiring harness 12352353 from 10 strap assemblies (15).


16
FORWARD
17
IN VEHICLE
LOOKING UP -
CREW COMPARTMENT

E Remove wiring harness 12352353 from 12 strap assemblies (16 and 17).

F Remove harness from vehicle.

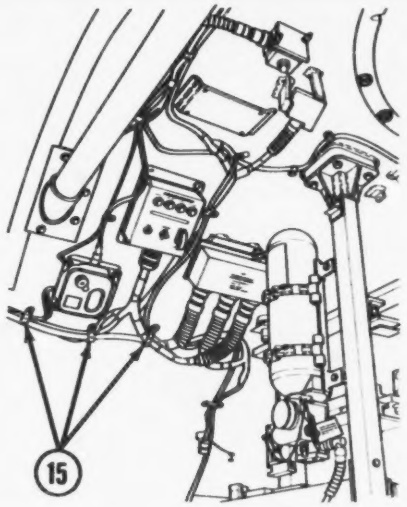
CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)


16
FORWARD
17
IN VEHICLE
LOOKING UP -
CREW COMPARTMENT

INSTALLATION

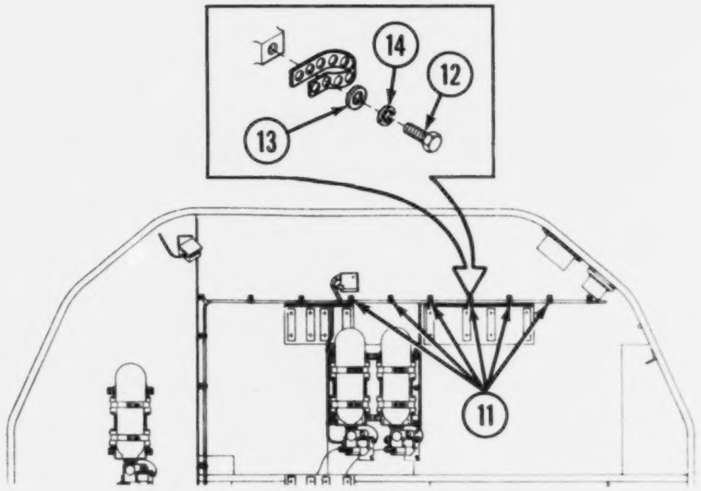
A Position harness in vehicle.

B Install wiring harness 12352353 in 12 strap assemblies (16 and 17).

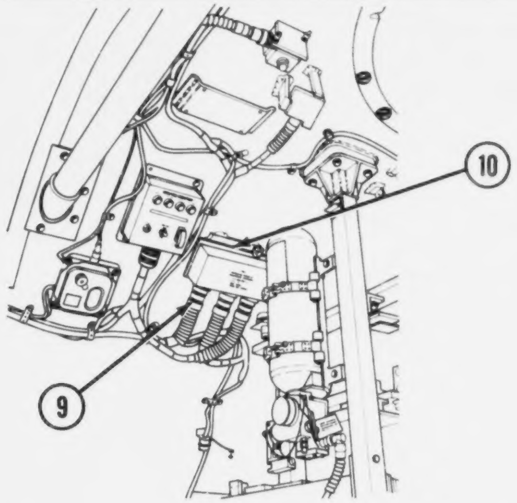


C Install wiring harness 12352353 in 10 strap assemblies (15).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

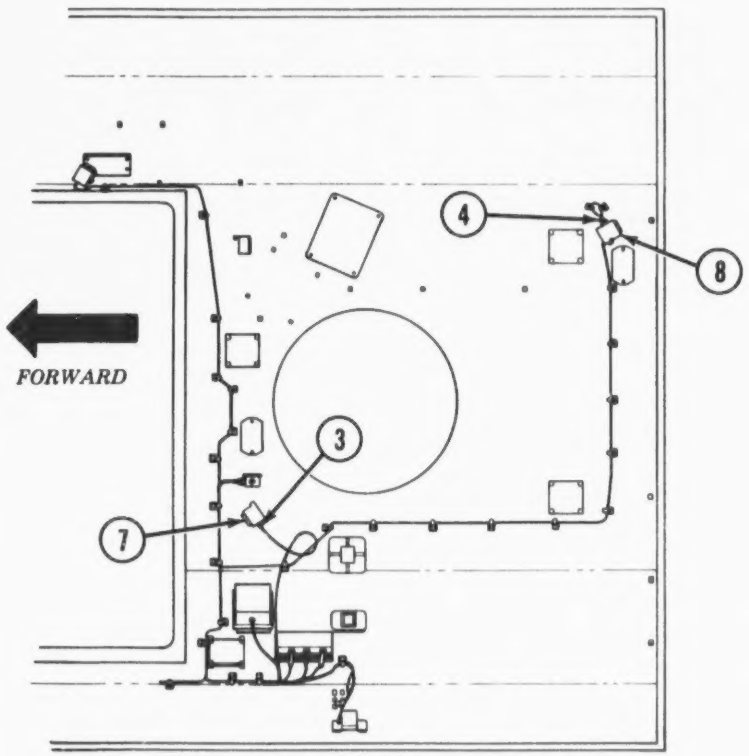


D Install wiring harness 12352353 using six strap assemblies (11) each secured with one screw (12), one flat washer (13) and one new lockwasher (14).

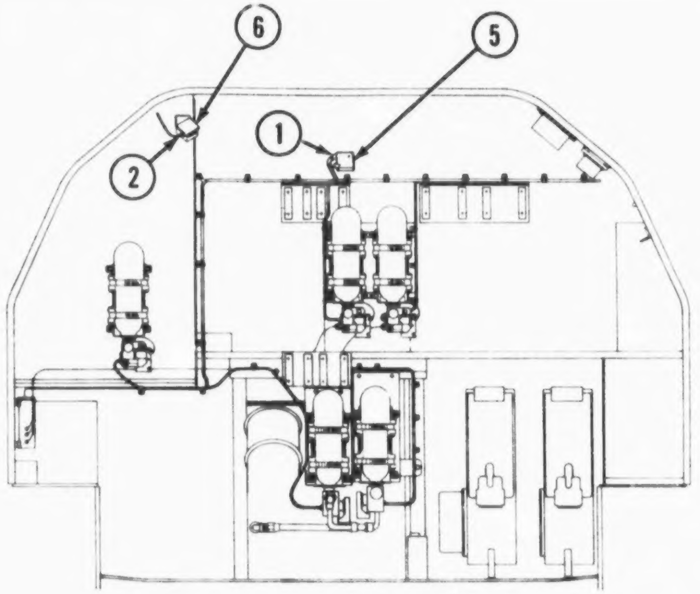


E Connect harness plug (9) to SCEA unit (10).

CREW AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



IN VEHICLE LOOKING UP - CREW COMPARTMENT



FORWARD BULKHEAD - CREW COMPARTMENT

F Connect harness plugs (1, 2, 3 and 4) to four OFSA units (5, 6, 7 and 8).

G Reactivate engine AFES (p 14-14.7).

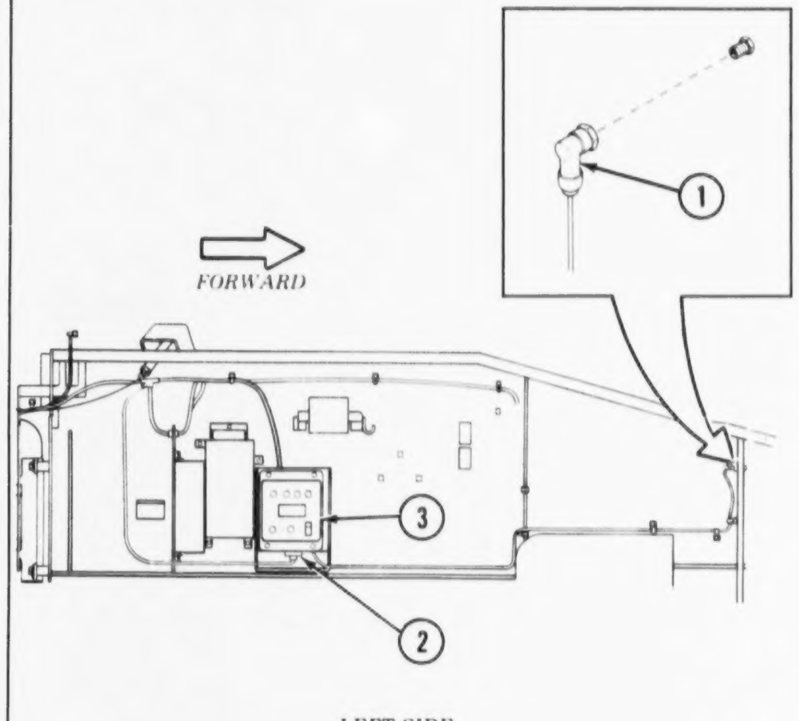
H Close crew compartment top doors (TM 9-2350-267-10).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION

INITIAL SETUP

Equipment Condition:

Engine AFES deactivated (p 14-14.3).
Left projectile rack removed (p 11-5).
Engine compartment extinguisher bottle brackets removed (p 14-30.4).



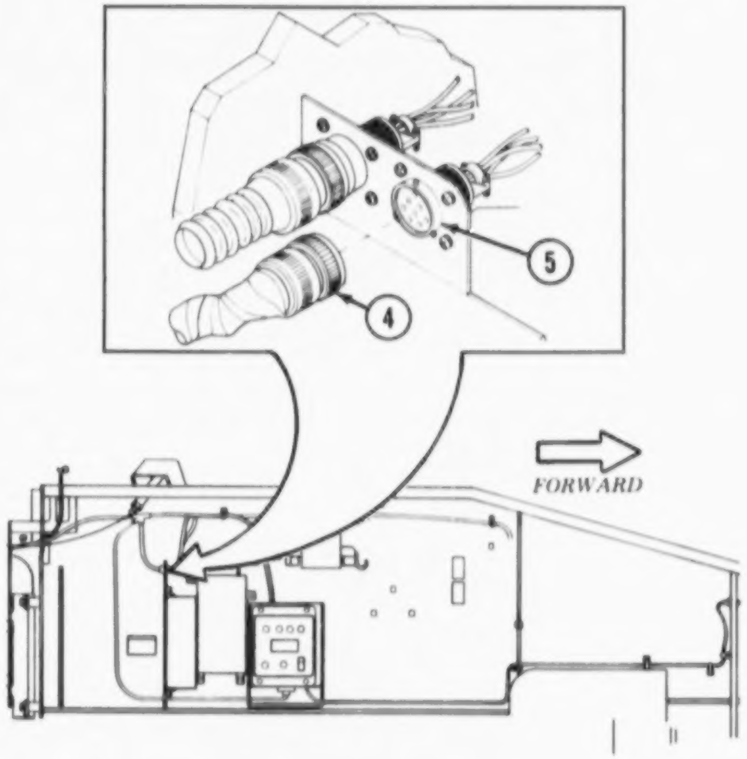
LEFT SIDE
DRIVER'S COMPARTMENT

HARNESS 12352354: REMOVAL

A Disconnect harness plugs P6 and P5 (1) from driver's compartment forward bulkhead.

B Disconnect harness plug P1 (2) from engine T/A panel (3).

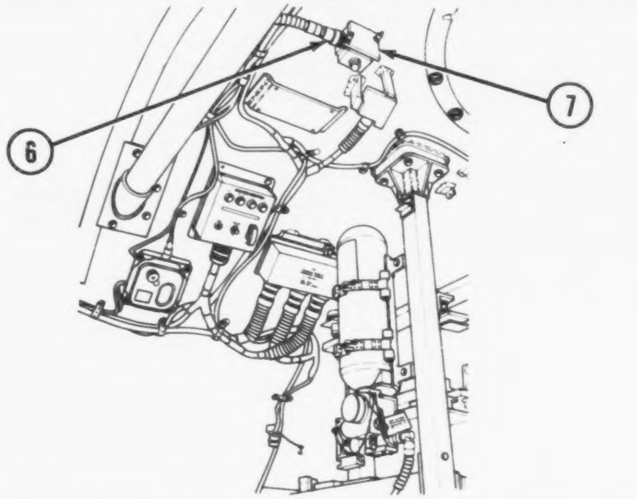
ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



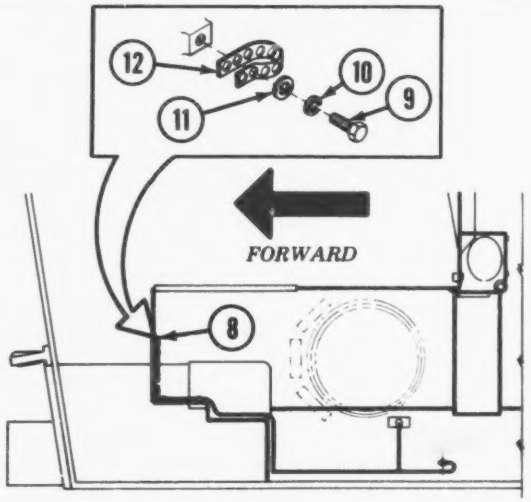
LEFT SIDE
DRIVER'S COMPARTMENT

C Disconnect harness plug P7 (4) from harness 12351461 connector (5).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



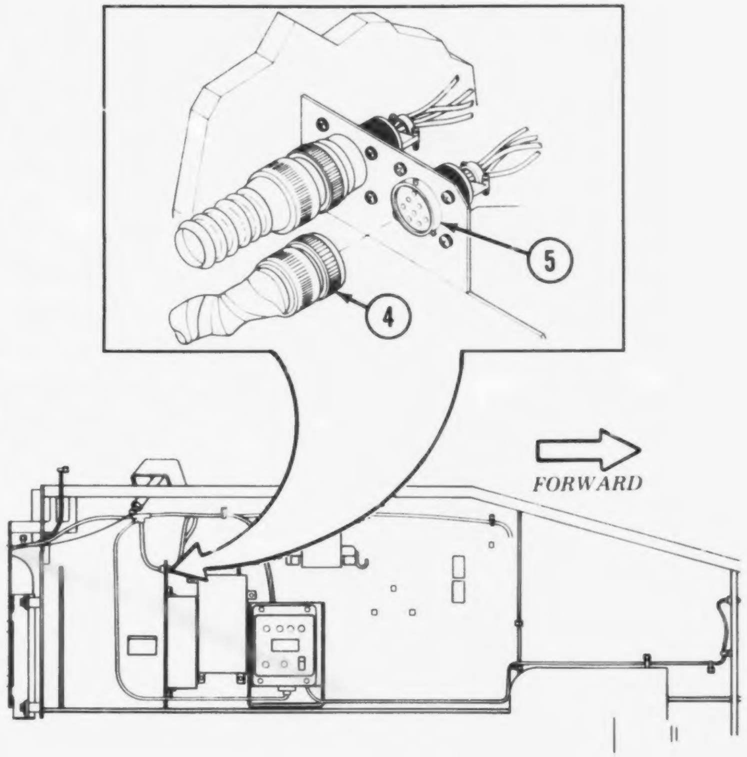
D Disconnect harness plug P4 (6) from RSI (7).



E Remove nine strap assemblies (8), each consisting of one screw (9), one lockwasher (10), one flat washer (11) and one strap (12).

DRIVER'S COMPARTMENT

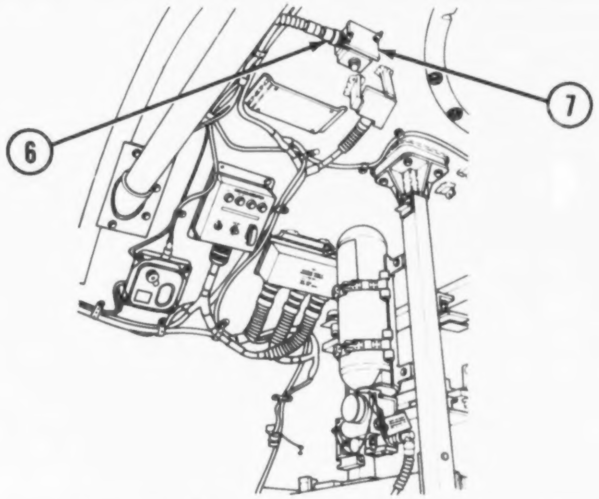
ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



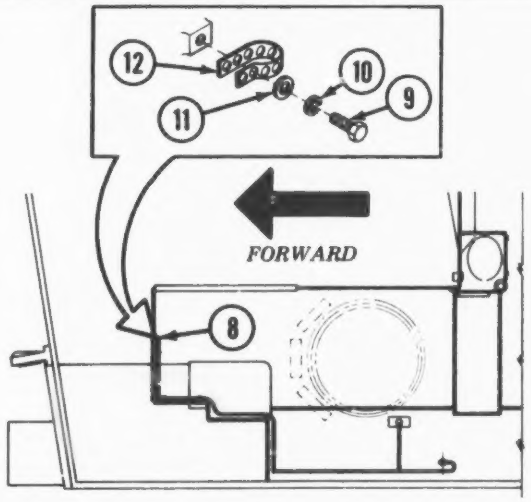
LEFT SIDE
DRIVER'S COMPARTMENT

C Disconnect harness plug P7 (4) from harness 12351461 connector (5).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



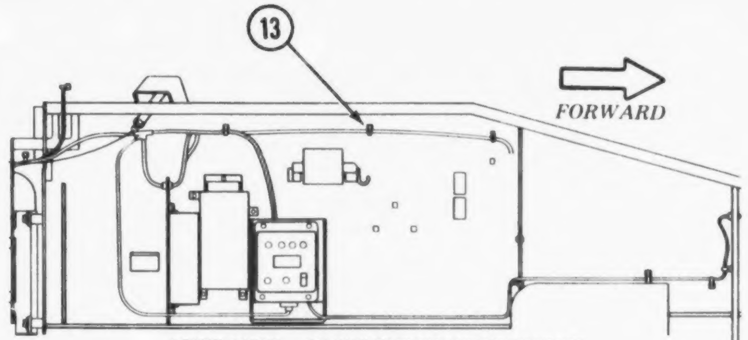
D Disconnect harness plug P4 (6) from RSI (7).



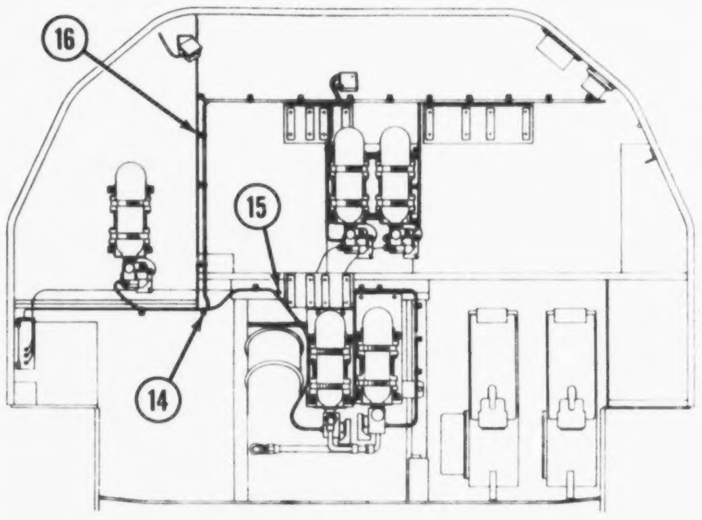
E Remove nine strap assemblies (8), each consisting of one screw (9), one lockwasher (10), one flat washer (11) and one strap (12).

DRIVER'S COMPARTMENT

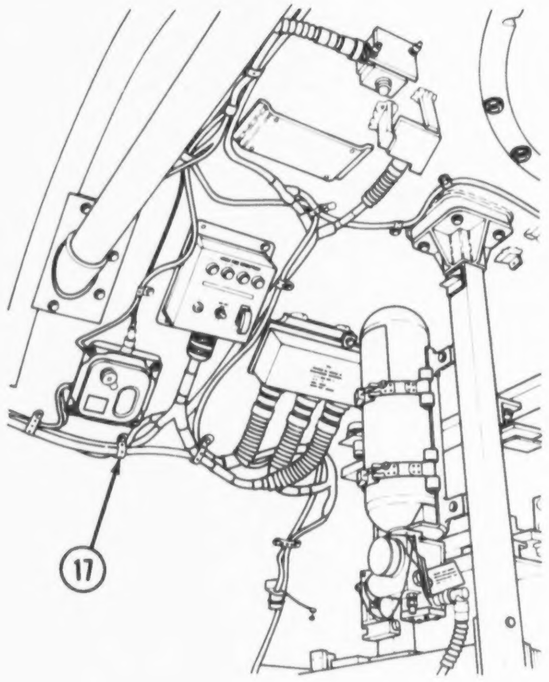
ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE — DRIVER'S COMPARTMENT

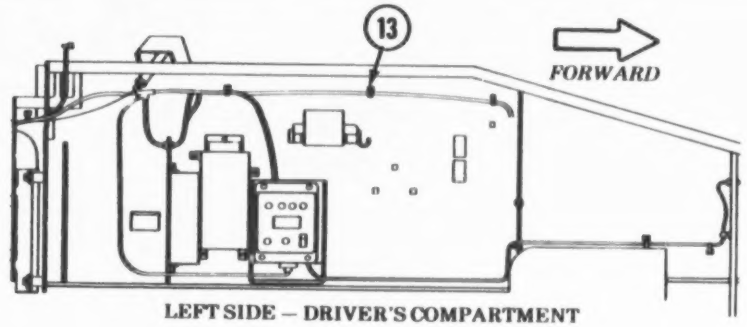


FORWARD BULKHEAD - CREW COMPARTMENT

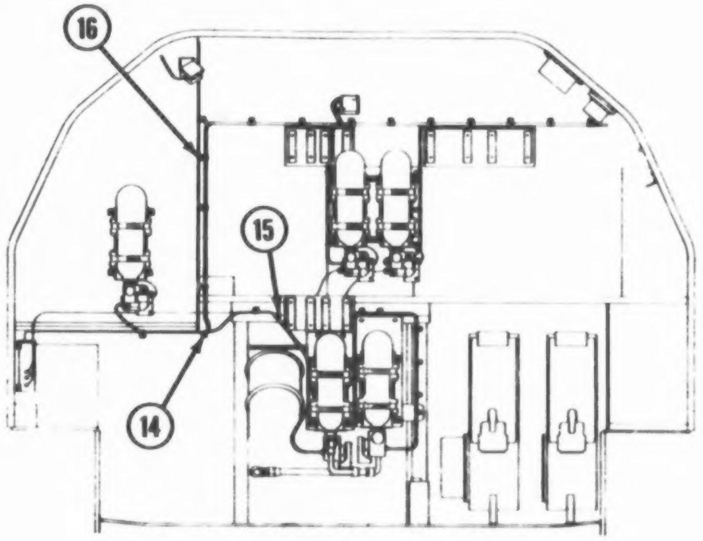


F Remove seven strap assemblies (13), strap assembly (14), seven strap assemblies (15), 13 strap assemblies (16) and 12 strap assemblies (17). Separate harness 12352354 from other harnesses and remove from vehicle.

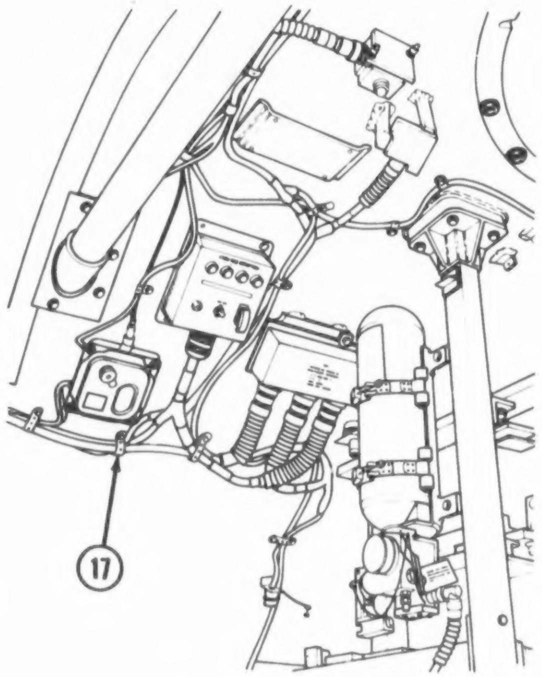
ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE – DRIVER'S COMPARTMENT



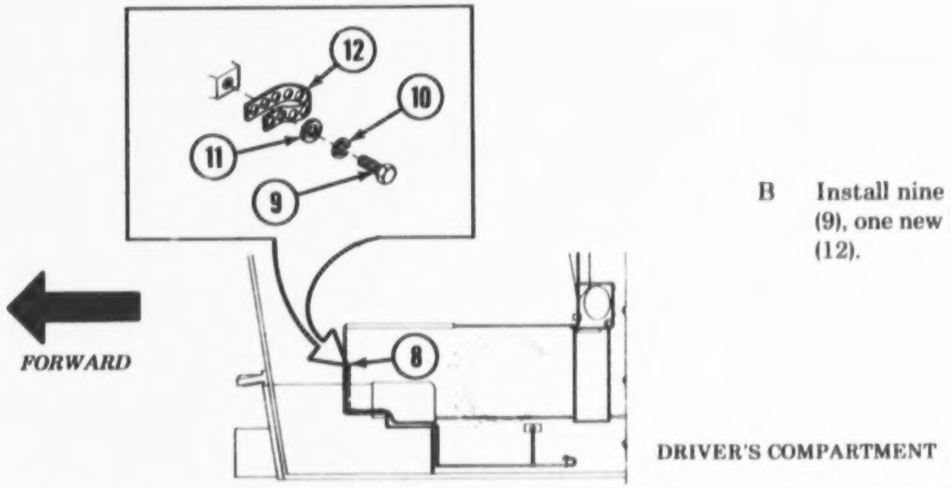
FORWARD BULKHEAD - CREW COMPARTMENT



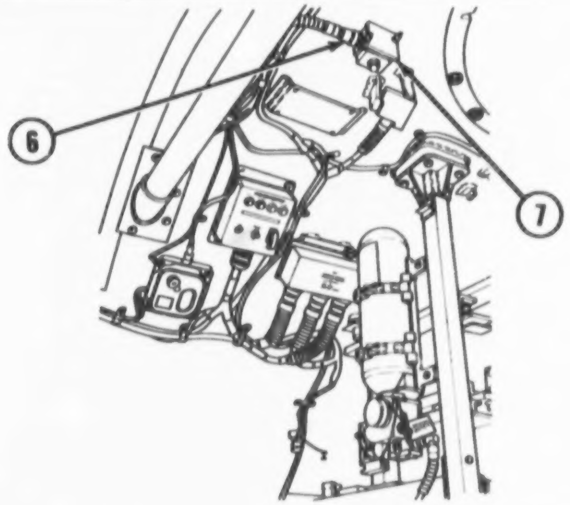
HARNESS 12352354: INSTALLATION

A Position harness 12352354 in vehicle. Install four strap assemblies (13), strap assembly (14), seven strap assemblies (15), 13 strap assemblies (16) and 12 strap assemblies (17).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)

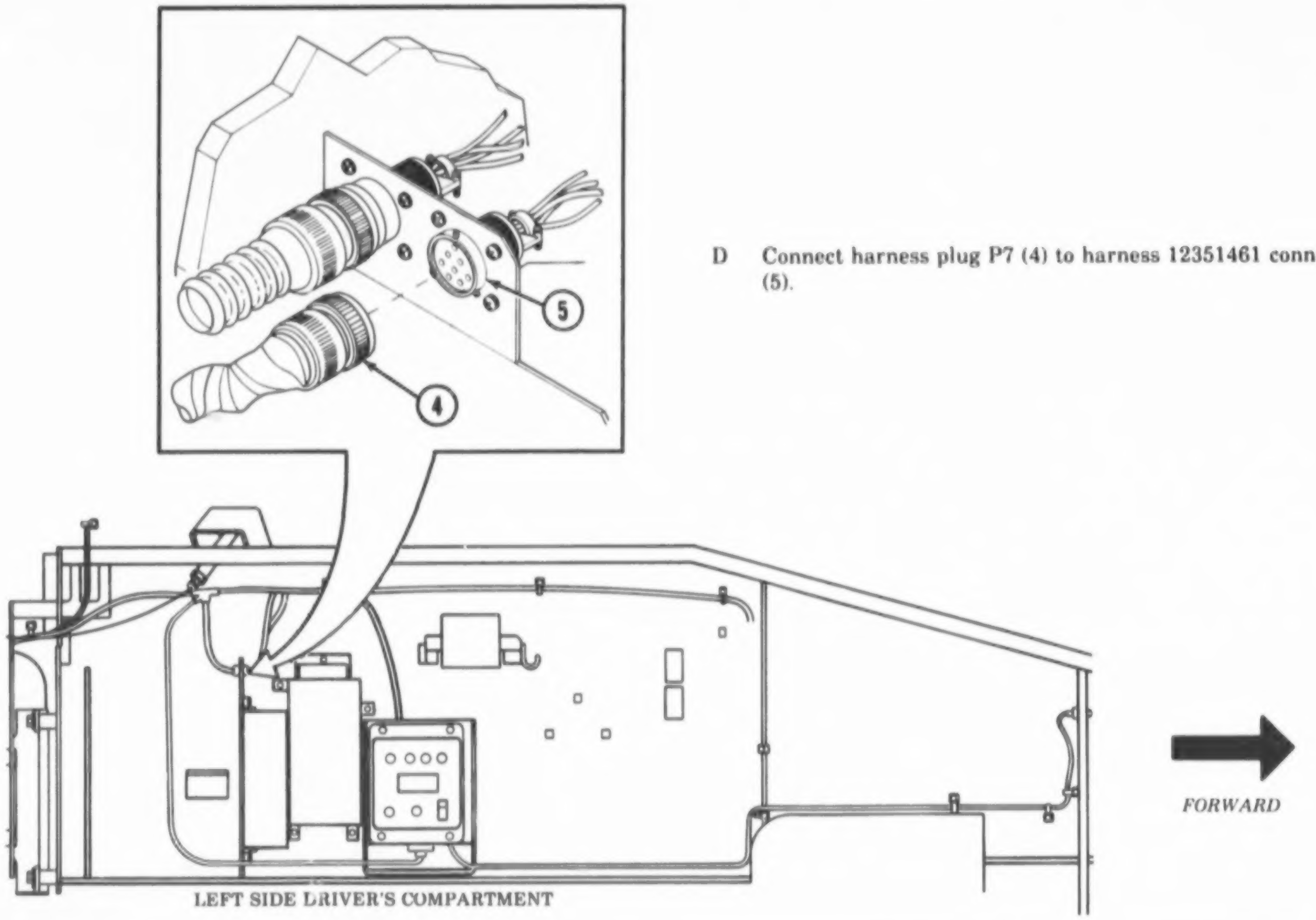

12
10
11
9
8
FORWARD
DRIVER'S COMPARTMENT

B Install nine strap assemblies (8), each consisting of one screw (9), one new lockwasher (10), one flat washer (11) and one strap (12).



C Connect harness plug (6) to RSI (7).

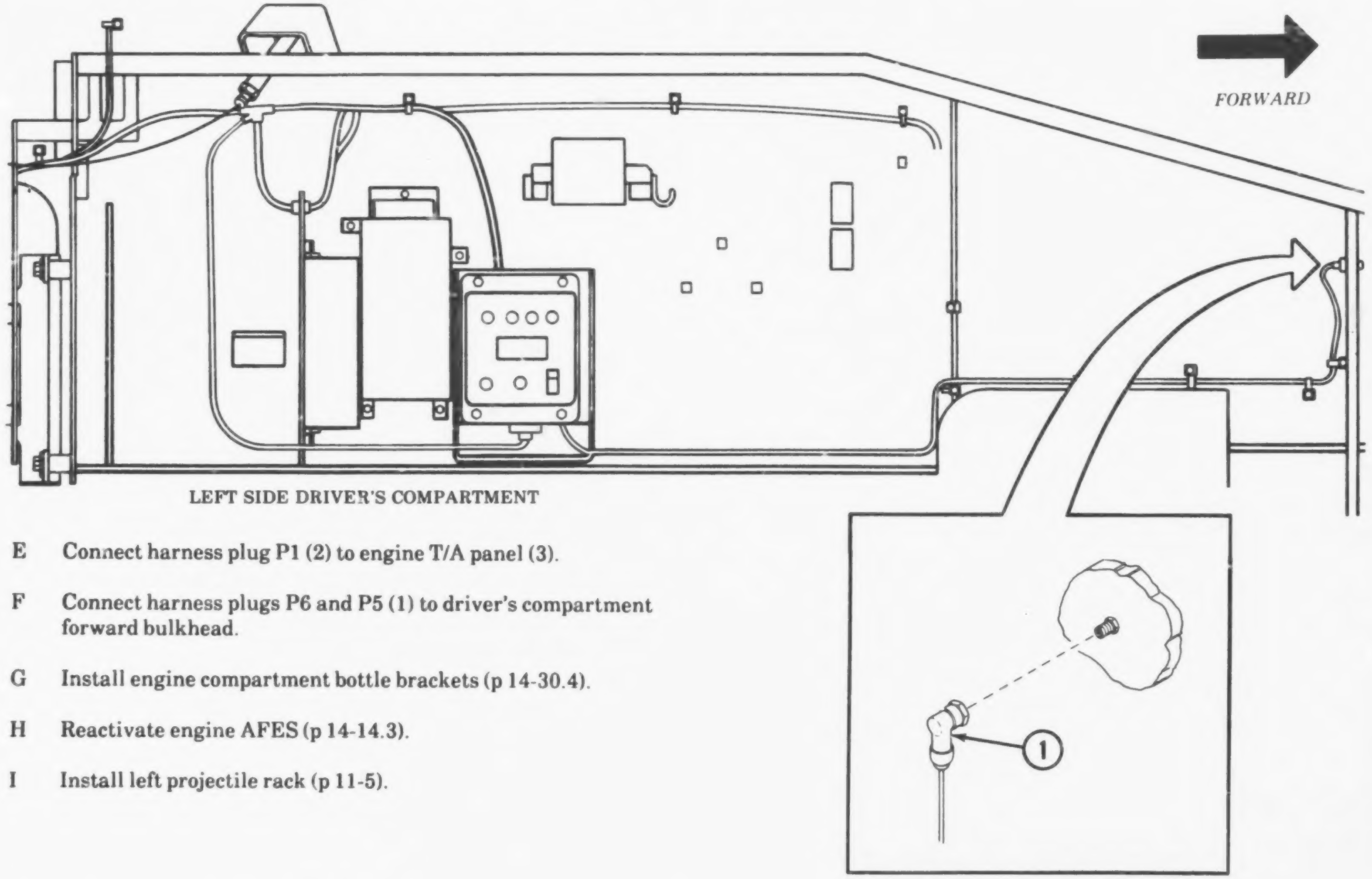
ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE DRIVER'S COMPARTMENT

D Connect harness plug P7 (4) to harness 12351461 connector (5).

ENGINE AFES ELECTRICAL WIRING HARNESSES (VEHICLES 345 AND ABOVE): REMOVAL AND INSTALLATION (CONTINUED)



LEFT SIDE DRIVER'S COMPARTMENT

E Connect harness plug P1 (2) to engine T/A panel (3).

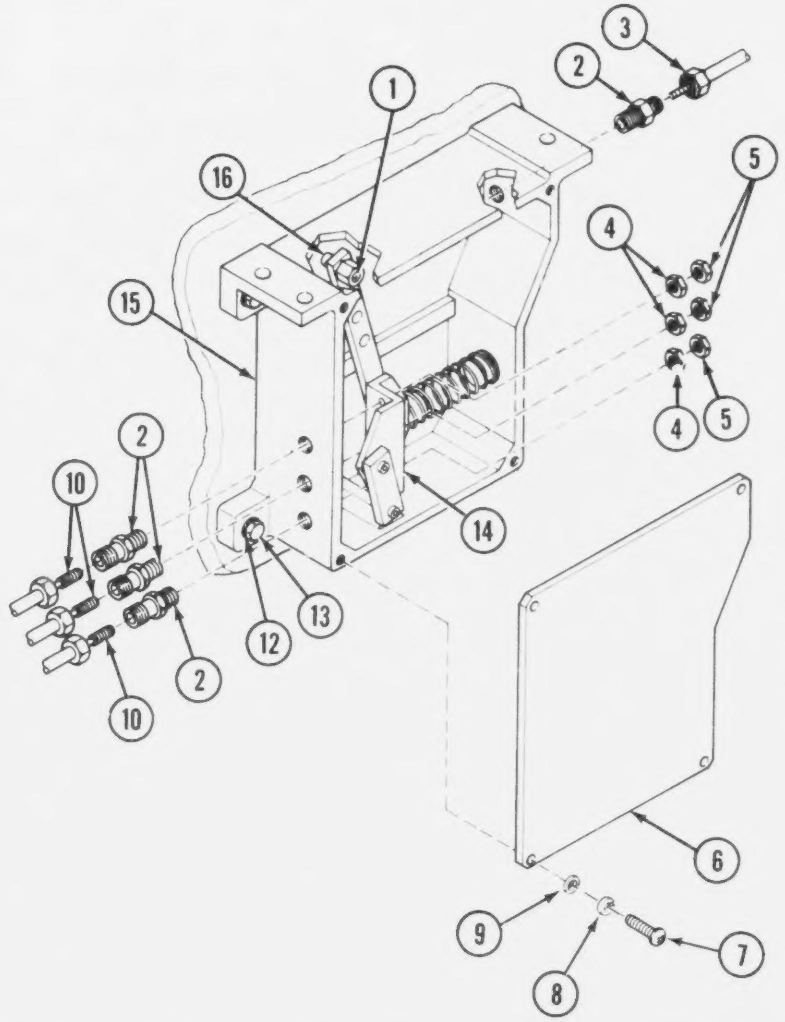
F Connect harness plugs P6 and P5 (1) to driver's compartment forward bulkhead.

G Install engine compartment bottle brackets (p 14-30.4).

H Reactivate engine AFES (p 14-14.3).

I Install left projectile rack (p 11-5).

AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION



REMOVAL

A Perform AFES deactivation (p 14-14.3 and p 14-14.7).

B Remove four screws (7), four lockwashers (8), four flat washers (9) and cover (6) from actuator assembly (15). Discard lockwashers.

C Loosen, but do not remove, socket head setscrew (1) securing handle cable assembly (3) to pin (16). Remove cable end from pin (16).

NOTE

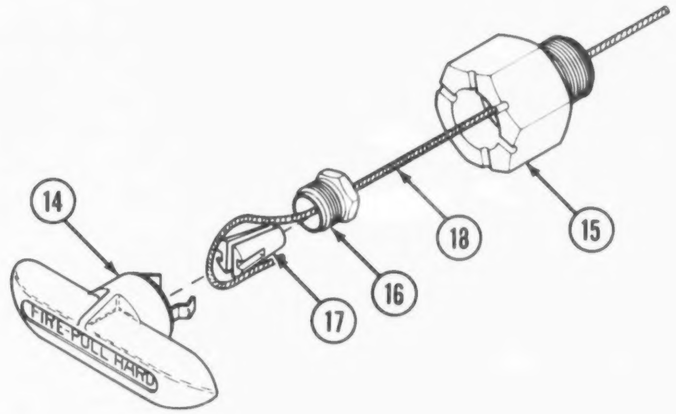
Tag cables for proper installation.

D Remove locknuts (5) and nuts (4) which hold each of three cylinder cables (10) to cable block (14). Discard locknuts.

E Remove threaded fittings (2) which hold handle cable and three cylinder cables onto actuator assembly (15). Withdraw cables from actuator assembly.

F Remove actuator assembly (15) from vehicle by removing four screws (13) and four lockwashers (12). Discard lockwashers.

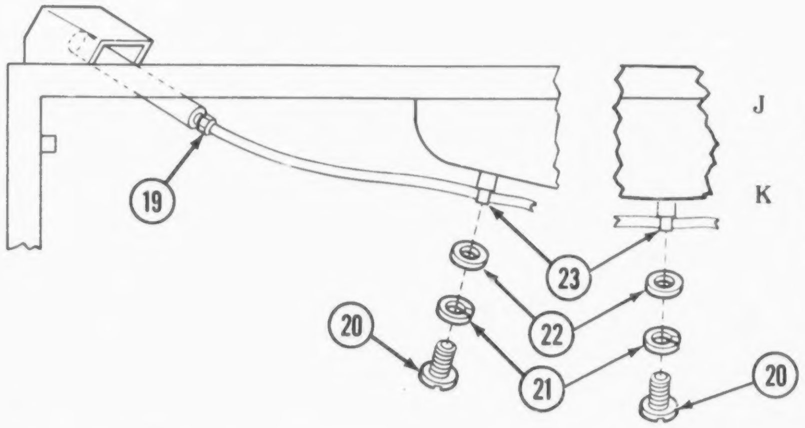
AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)



G Pull handle (14) free of nut (15).

H Back fastener assembly (16) from handle (14). Pull wedge (17) from fastener (16) and remove cable (18).

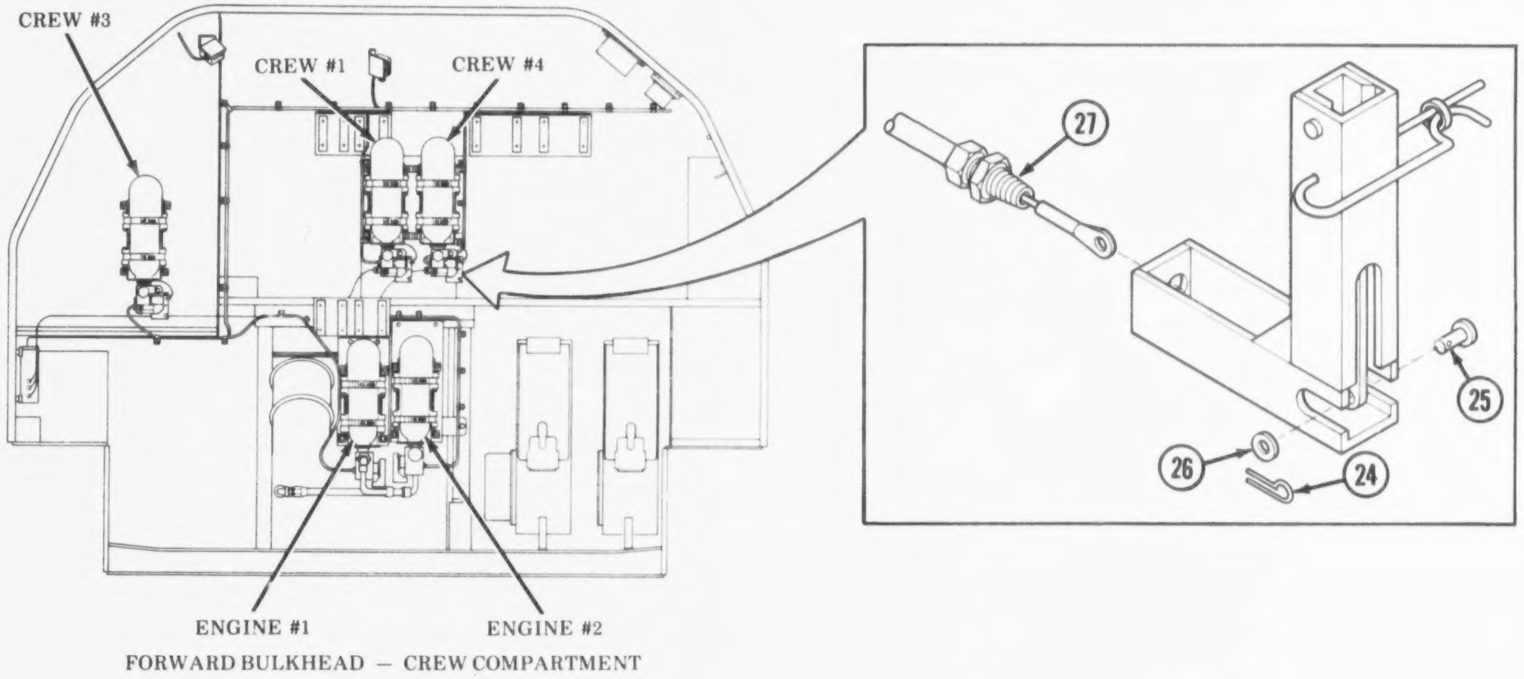
I Remove nut (15) from outside end of handle tube.



J Remove adapter (19) from inside end of handle tube, and pull cable free of tube from inside vehicle.

K Remove screws (20), lockwashers (21) and flat washers (22) from cable straps (23). Remove cable straps from cable. Remove cable from vehicle. Discard lockwashers.

AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)

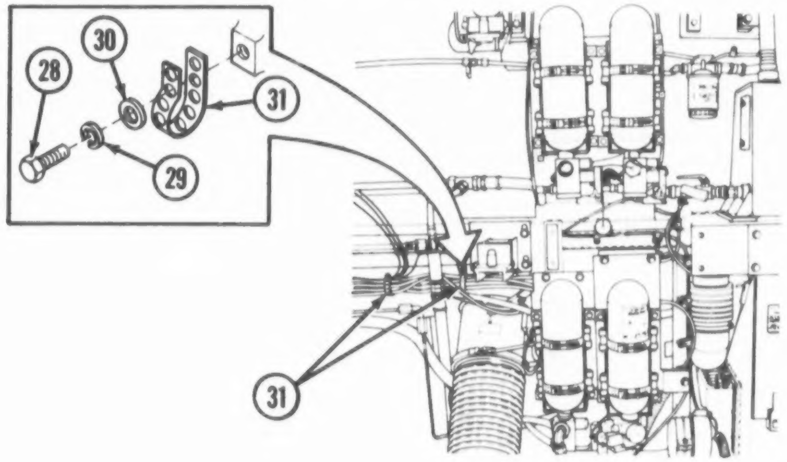

CREW #3
CREW #1
CREW #4
ENGINE #1
ENGINE #2
FORWARD BULKHEAD — CREW COMPARTMENT
27
25
26
24

L Remove and discard cotter pins (24) from cable pins (25) at crew fire extinguishers no. 3 and no. 4 and engine fire extinguisher no. 2. Remove cable pin (25) and flat washer (26) from each extinguisher.

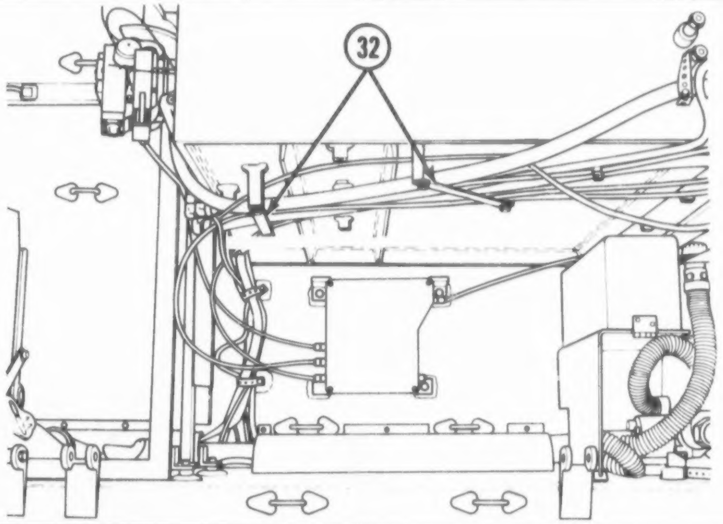
M Remove threaded fittings (27) which hold cables to crew fire extinguishers no. 3 and no. 4 and engine fire extinguisher no. 2. Remove cables from extinguishers.

N Remove cable for crew extinguisher no. 3 from the vehicle, removing and replacing strap assemblies as needed.

AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)

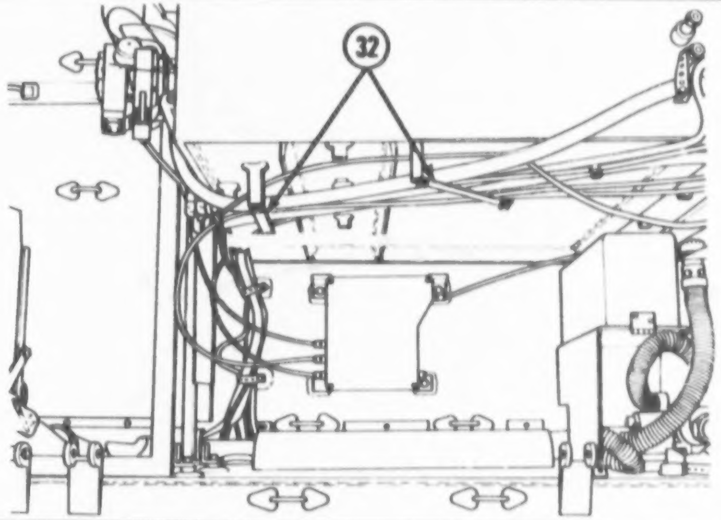


O Remove screw (28), lockwasher (29) and flat washer (30) from each cable strap (31) as required. Remove cable straps (two straps for crew fire extinguisher no. 4 and five for engine fire extinguisher no. 2) and harnesses. Discard lockwashers.



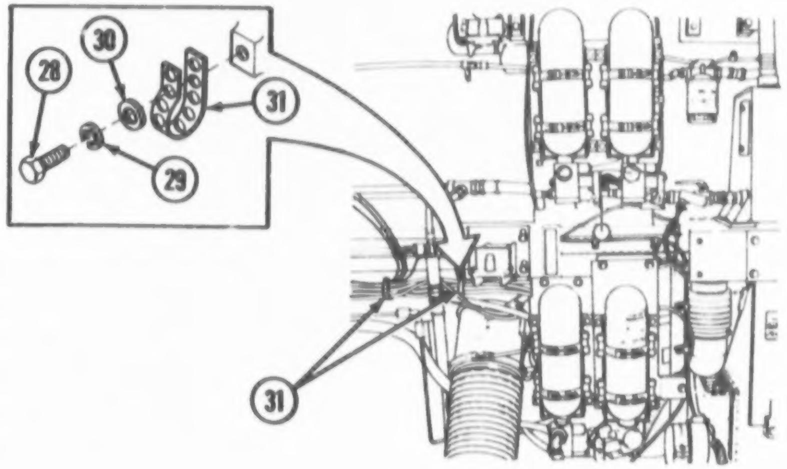
P Remove cables (for crew fire extinguisher no. 4 and engine fire extinguisher no. 2) from two brackets (32) under APU compartment. Remove cables from vehicle.

AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)



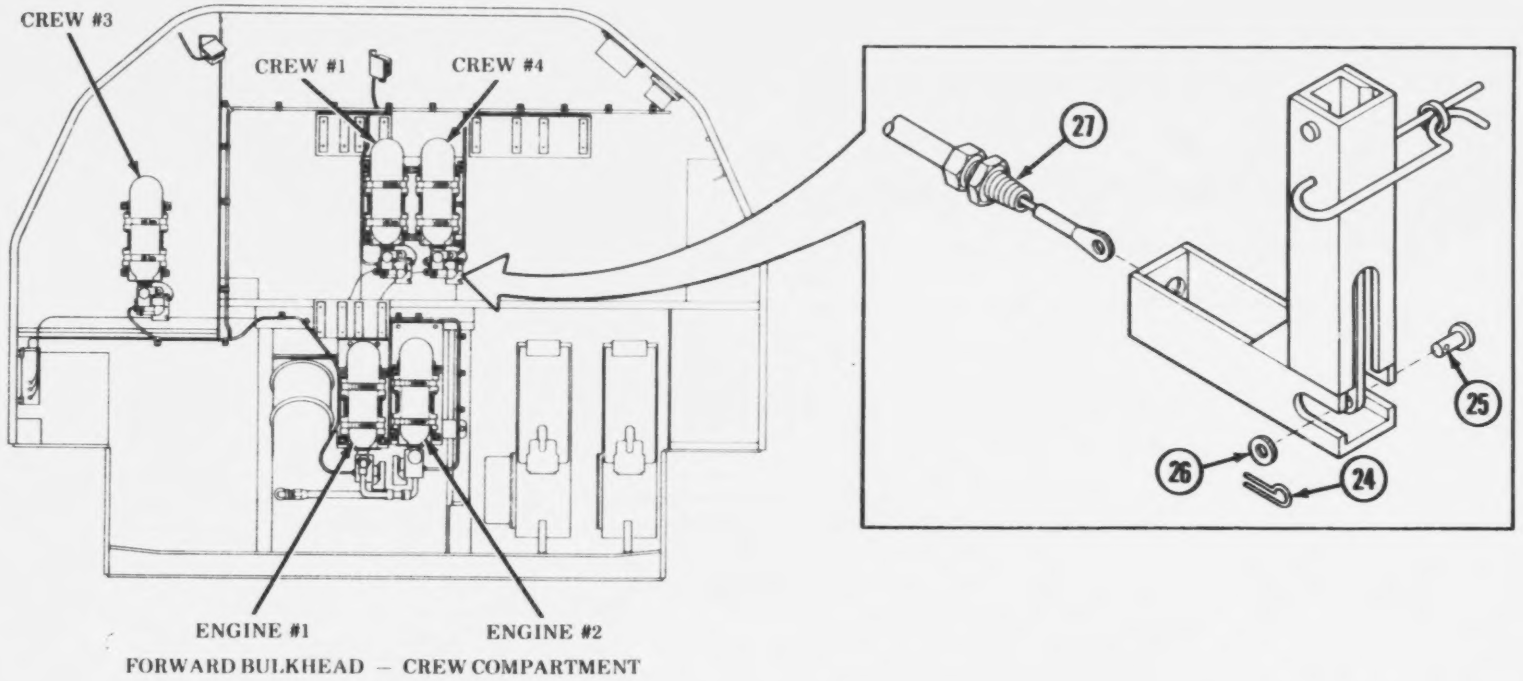
INSTALLATION

A Install cables (for crew fire extinguisher no. 4 and engine fire extinguisher no. 2) in two brackets (32) under APU compartment.



B Install cable straps (31) securing cables and harnesses with screw (28), new lockwasher (29) and flat washer (30) for each strap (two straps needed for crew fire extinguisher no. 4 and five for engine fire extinguisher no. 2).

AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)


CREW #3
CREW #1
CREW #4
27
25
26
24
ENGINE #1
ENGINE #2
FORWARD BULKHEAD – CREW COMPARTMENT

C Install threaded fittings (27) that hold cables to crew fire extinguishers no. 3 and no. 4 and engine fire extinguisher no. 2.

D Secure cables to crew fire extinguishers no. 3 and no. 4 and engine fire extinguisher no. 2 using cable pin (25), flat washer (26) and new cotter pin (24) for each cable.

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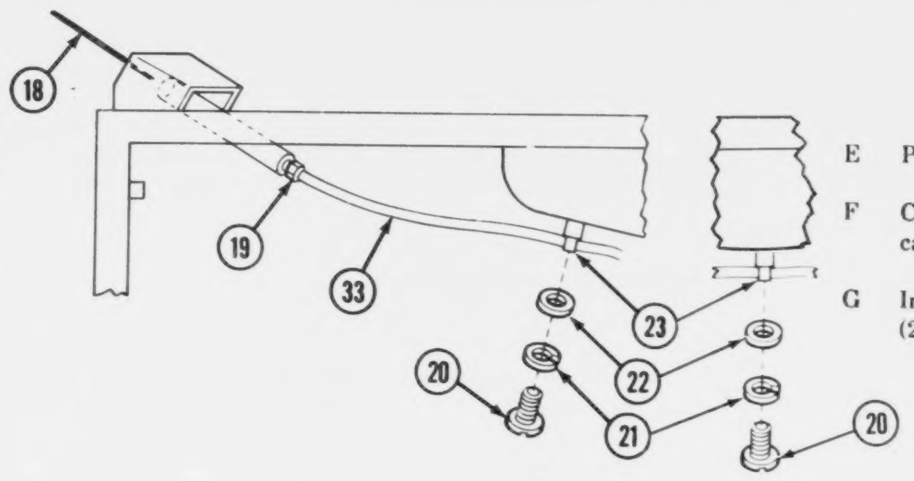
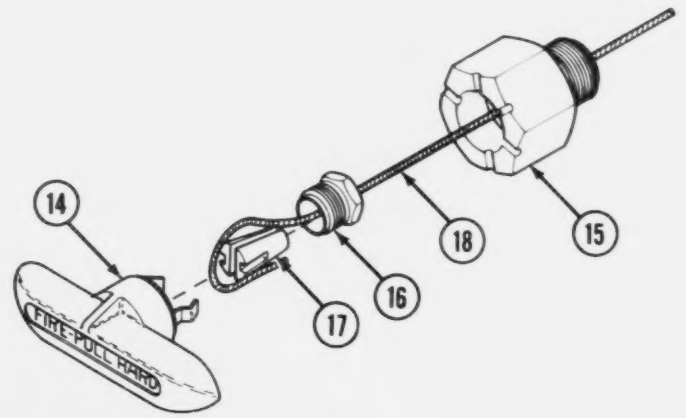
AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)



E Pull cable (18) from cable sheath (33).

F Connect adapter (19) to inside end of handle tube and feed cable (18) through cable sheath (33) from outside of vehicle.

G Install each cable strap (23) with screw (20), new lockwasher (21) and flat washer (22).



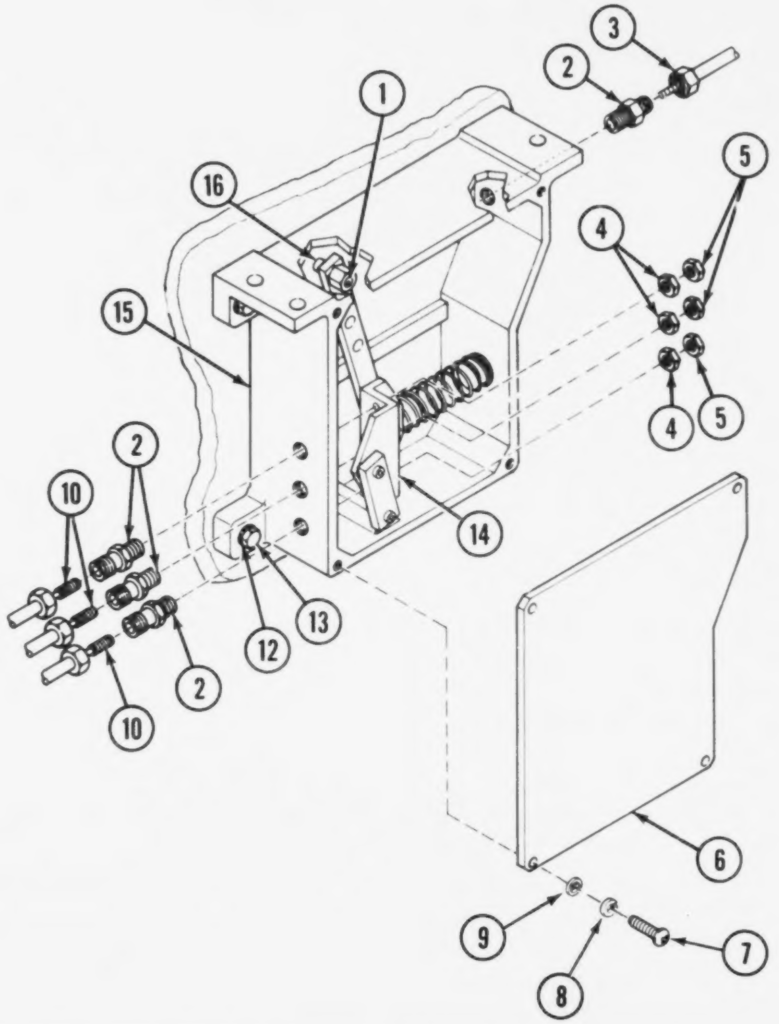
H Install nut (15) on outside end of handle tube.

I Secure cable (18) to wedge (17) with fastener (16).

J Install handle (14) on cable (18) by tightening fastener (16).

K Secure handle (14) to nut (15).

■ AFES MANUAL DISCHARGE SYSTEM: REMOVAL AND INSTALLATION (CONTINUED)



NOTE

Liberally lubricate all internal parts of actuator assembly before installation.

L Install actuator assembly (15) in vehicle with four screws (13) and four new lockwashers (12).

M Install four threaded fittings (2) in actuator assembly (15) and install cables (10).

N Loosely secure three cylinder cables (10) to cable block (14) with nut (5) and new locknut (4) for each cable.

O Loosely secure handle cable assembly (3) to pin (6) by tightening socket head setscrews (1).

P Perform AFES actuator assembly cable adjustment procedure (p 14-55).

Q Install cover (6) on actuator assembly (15) with four screws (7), four new lockwashers (8) and four flat washers (9).

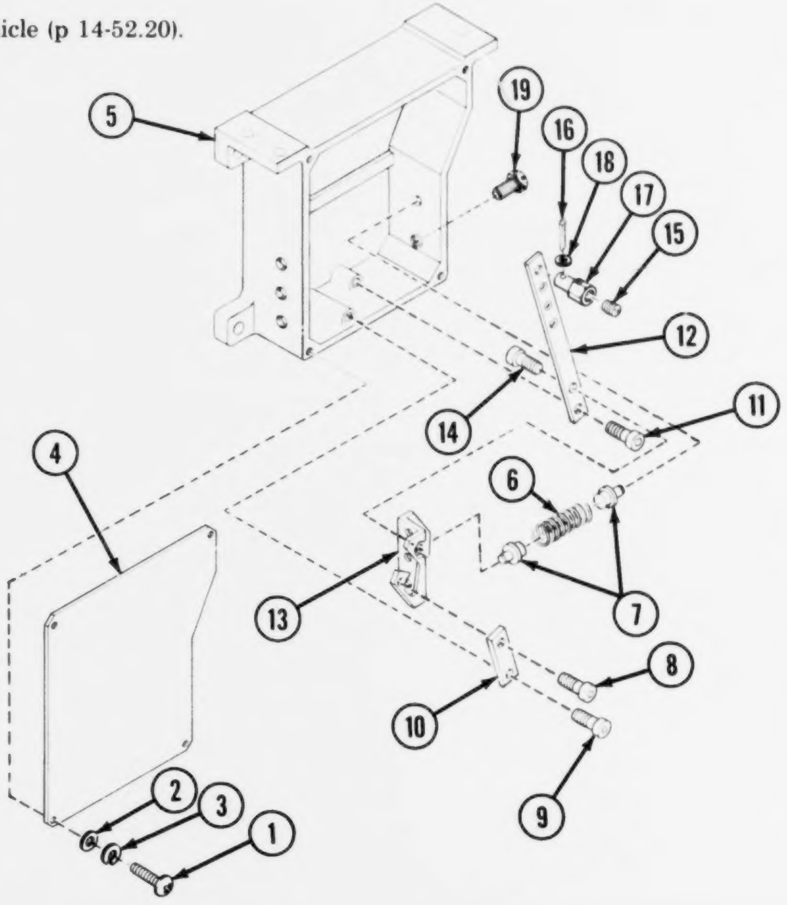
R Perform AFES reactivation (p 14-14.5 and 14-14.8).

AFES MANUAL DISCHARGE SYSTEM: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Equipment Condition:

Actuator assembly removed from vehicle (p 14-52.20).



5
19
16
18
17
15
12
11
14
4
6
13
7
8
10
9
2
3
1

AFES MANUAL DISCHARGE SYSTEM: DISASSEMBLY AND ASSEMBLY (CONTINUED)

DISASSEMBLY

A Remove four screws (1), four lockwashers (3), four flat washers (2) and cover (4) from actuator housing (5). Discard lockwashers.

B Compress and remove spring (6). Remove two spring guides (7).

C Remove two shouldered screws (8 and 9) and arm (10).

D Remove shouldered screw (11), arm (12) and block (13).

E Remove shouldered screw (14) and arm (12) from block (13).

F Remove setscrew (15) and cotter pin (16) from pin (17). Discard cotter pin.

G Remove pin (17) and flat washer (18) from arm (12).

H Remove plug (19) from housing (5).

ASSEMBLY

A Install plug (19) in housing (5).

B Install flat washer (18) and pin (17) in arm (12). Secure with new cotter pin (16).

C Loosely install setscrew (15) in pin (17).

D Install arm (12) on block (13) with shouldered screw (14).

E Install arm (12) with block (13) in housing (5) with shouldered screw (11).

F Install arm (10) on block (13) and housing (5) with shouldered screws (8 and 9).

G Install two spring guides (7); one in housing (5) and one on block (13).

H Install spring (6) between two spring guides (7).

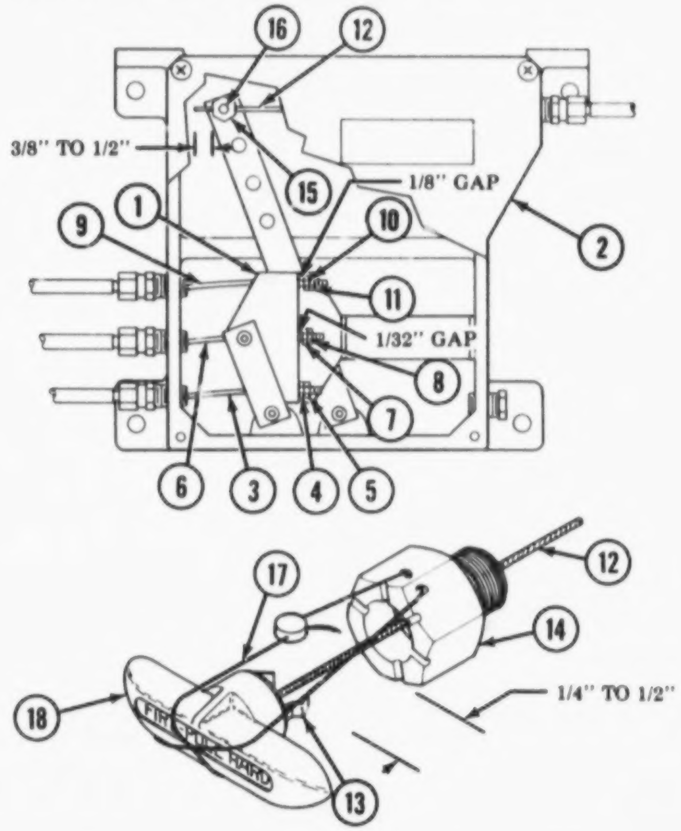
I Install cover (4) on housing (5) with four screws (1), four new lockwashers (3) and four flat washers (2).

AFES MANUAL DISCHARGE SYSTEM: CABLE ADJUSTMENT PROCEDURE

INITIAL SETUP

Equipment Condition:

AFES deactivated (p 14-14.3 and p 14-14.7).
Actuator assembly cover removed (p 14-52.20)



ADJUSTMENT

A Remove slack from bottom cable (3) at actuator block (1) in actuator assembly (2). Set adjustment nut (4) against actuator block (1). Turn locking nut (5) until flush against adjustment nut.

B Remove slack from middle cable (6). Set adjustment nut (7) for a 1/32-inch gap to actuator block (1). Tighten locking nut (8).

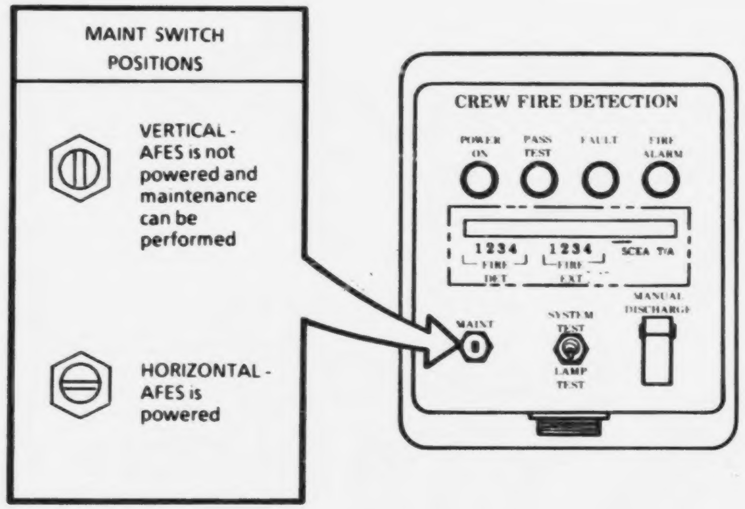
C Remove slack from top cable (9). Set adjustment nut (10) for a 1/8-inch gap to actuator block (1). Tighten locking nut (11).

D Remove slack from handle cable (12). Adjust cable length for a 1/4 to 1/2-inch gap between the handle retaining springs (13) and packing nut (14). Secure the actuator assembly end of the cable to pin (15) by tightening setscrew (16).

E Cut off excess handle cable (12) length inside actuator assembly (2) to leave 3/8 to 1/2-inch beyond pin (15).

F Install fire extinguisher seal (17) through nut (14) and around handle (18).

CREW AUTOMATIC FIRE EXTINGUISHER SYSTEM TEST (VEHICLES 1 THRU 344)


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
1234
FIRE DET
1234
FIRE EXT
SCEA T/A
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

WARNING

Install anti-recoil plugs in all four crew compartment fire extinguishers. Turn MASTER switch OFF.

CREW FIRE DETECTION SYSTEM TEST

A Make sure all system components are connected.

B Turn MASTER switch OFF.

WARNING

If T/A panel POWER ON light does not go out when T/A panel MAINTenance switch is turned to vertical position, disconnect battery ground lead. DO NOT CONTINUE TEST. Troubleshoot AFES (p 2-296).

C Turn crew T/A panel MAINTenance switch to vertical position.

WARNING

Electrical connectors must be disconnected from AFES extinguisher actuators or discharge of Halon will occur during test.

NOTE

Optional method. Disconnect center connector (J2) on SCEA instead of connectors on bottles. This disconnects all bottles at once and saves time by not having to move projectile racks to access bottles behind racks.

D Disconnect electrical connectors from four crew AFES extinguishers.

E Turn crew T/A panel MAINTenance switch to horizontal position.

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 1 THRU 344) (CONTINUED)

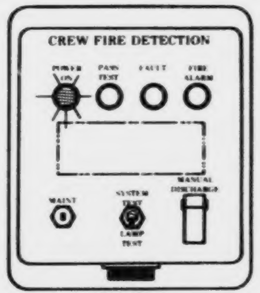
F Turn MASTER switch ON and observe crew T/A panel lights. Check for following sequence:

1 Green POWER ON light comes ON immediately and stays lit.

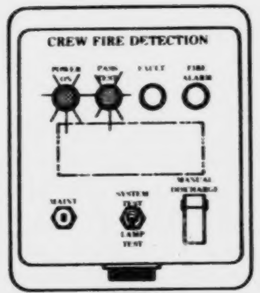
2 Within 6 seconds, green PASS TEST light comes on.

3 PASS TEST light will go out.

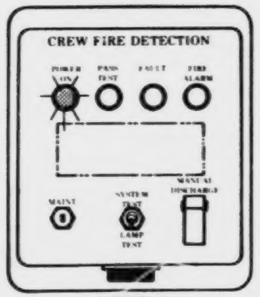
4 Yellow FAULT light will come on and remain lit.


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

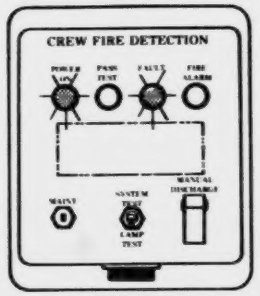
STEP 1


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 2


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 3


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 4

G Press LAMP TEST toggle switch down and inspect all four lamps and 10 LED's located under fault identification access cover. Replace any lamp that is burned out. If any LED does not light, replace crew T/A panel (p 14-40).

WARNING

Make sure anti-recoil plugs are installed in crew AFES extinguisher discharge ports. Make sure extinguisher electrical connectors are disconnected, see steps A thru D.

H Lift red guard covering crew T/A panel MANUAL DISCHARGE toggle switch. Push toggle switch up to discharge position and release. The personnel ventilator system will automatically turn on in the exhaust mode 8 to 10 seconds after actuating system. If not, troubleshoot personnel ventilator blower system (p 2-177).

I Press ventilator blower RESET switch, located on accessory control panel, to shut off personnel ventilator blower.

J Lower red guard cover to cover MANUAL DISCHARGE switch.

K Turn crew T/A panel MAINTenance switch to vertical position.

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 1 THRU 344) (CONTINUED)

WARNING

Make sure crew T/A panel MAINTenance switch is turned to vertical position.

L Reconnect electrical connectors to crew compartment AFES extinguishers.

M Turn crew T/A panel MAINTenance switch to horizontal position.

N Light sequence should repeat as in step F except yellow FAULT light should not come on. If it does, troubleshoot crew fire detection system (p 2-296).

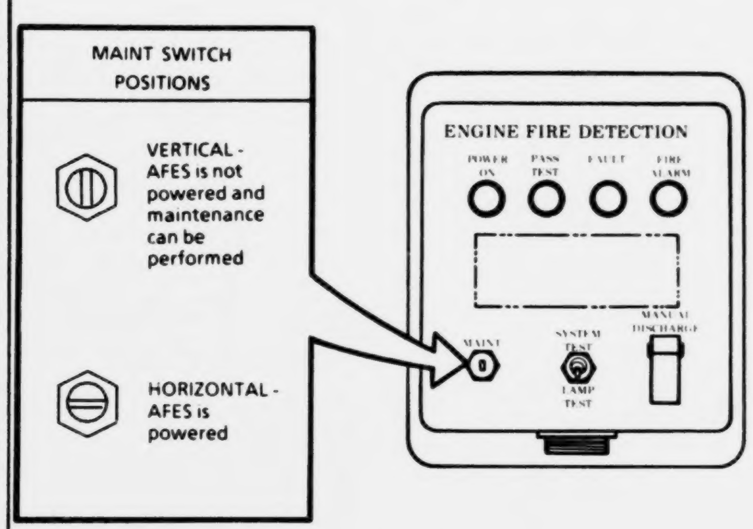
O Press SYSTEM TEST switch up to activate system test. Light sequence should repeat as in step F except yellow FAULT light should not come on.

P Turn MASTER switch OFF and observe crew T/A panel. Green POWER ON light will remain on. If not, troubleshoot crew fire detection system (p 2-296).

Q Turn crew T/A panel MAINTenance switch to vertical position and observe crew T/A panel. All lights should go out. If not, troubleshoot AFES (p 2-296).

R Turn crew T/A panel MAINTenance switch to horizontal position.

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 1 THRU 344)


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

ENGINE FIRE DETECTION SYSTEM TEST

A Make sure all system components are connected.

B Turn MASTER switch OFF.

C Turn engine T/A panel MAINTenance switch to vertical position.

WARNING

If T/A panel POWER ON lamp does not go out when T/A panel MAINTenance switch is turned to vertical position, disconnect battery ground lead. DO NOT CONTINUE TEST. Troubleshoot AFES (p 2-281).

WARNING

Electrical connectors must be disconnected from AFES extinguisher actuators or discharge of Halon will occur during test.

D Disconnect electrical connectors from both engine AFES extinguishers.

E Turn engine T/A panel MAINTenance switch to horizontal position.

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 1 THRU 344) (CONTINUED)

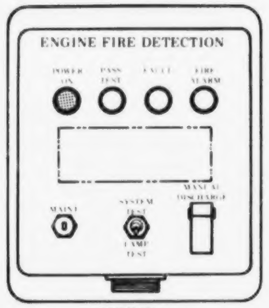
F Turn MASTER switch ON and observe engine T/A panel lights. Check for following sequence:

1 Green POWER ON light comes on immediately and stays lit.

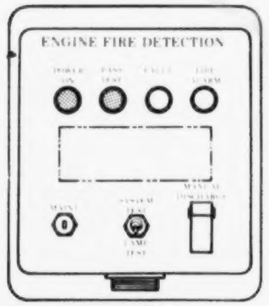
2 Within 6 seconds, green PASS TEST light comes on.

3 PASS TEST light will go out.

4 Yellow FAULT light will come on and remain on.


ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 1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PASS TEST
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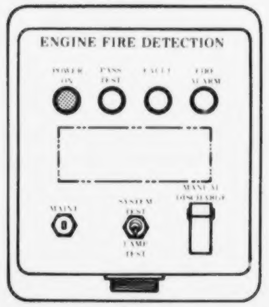
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 2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POWER ON
PASS TEST
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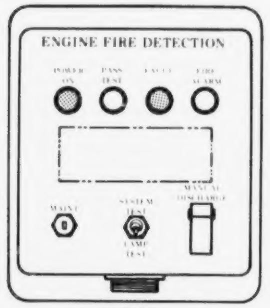
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 3


ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 4

G Press LAMP TEST toggle switch down and inspect all four lamps. Replace defective bulbs.

H Lift fault identifications access cover. If any LED does not light when LAMP TEST toggle switch is pressed, replace engine T/A panel (p 14-39).

WARNING

If T/A panel POWER ON lamp does not go out when T/A panel MAINTenance switch is turned to vertical position, disconnect battery ground lead. DO NOT CONTINUE TEST. Troubleshoot AFES (p 2-281).

I Turn engine T/A panel MAINTenance switch to vertical position. All lights on T/A panel should go out.

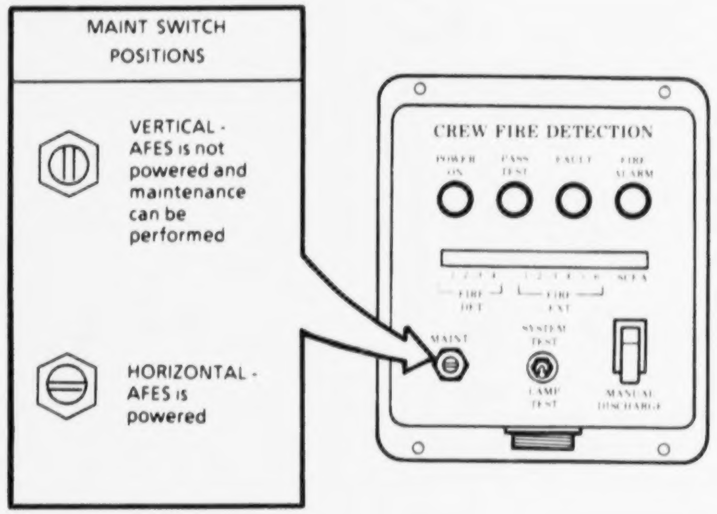
J Connect electrical connectors to engine AFES extinguisher bottle actuators.

K Turn engine T/A panel MAINTenance switch to horizontal position and observe panel lights. Sequence will be the same as in step F, except yellow FAULT light will not come on. If it does, troubleshoot engine fire detection system (p 2-281).

L Turn vehicle MASTER switch OFF. Observe engine T/A panel lights. Green POWER ON lamp should remain lit. If not, troubleshoot engine fire detection system (p 2-281).

M Turn engine T/A panel MAINTenance switch to horizontal position.

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE)


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
1 2 3 4
FIRE DET
1 2 3 4 5 6
FIRE EXT
SCEA
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

WARNING

Make sure anti-recoil plugs are installed in all six crew compartment fire extinguishers. Make sure MASTER switch is OFF.

CREW FIRE DETECTION SYSTEM TEST

A Make sure all system components are connected.

B Turn MASTER switch OFF.

WARNING

If T/A panel POWER ON light does not go out when T/A panel MAINTenance switch is turned to vertical position, disconnect battery ground lead. DO NOT CONTINUE TEST. Troubleshoot AFES (p 2-306.18).

C Turn crew T/A panel MAINTenance switch to vertical position.

WARNING

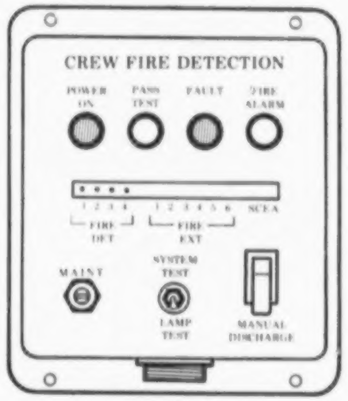
Electrical connectors must be disconnected from AFES extinguisher actuators or discharge of Halon will occur during test.

NOTE

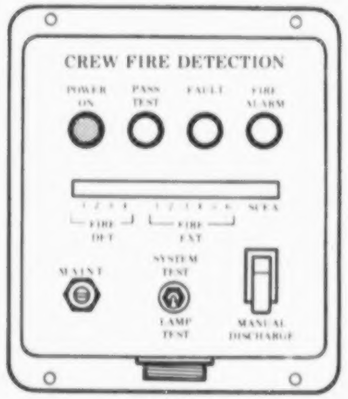
Optional method - Disconnect center connector (J2) on SCEA instead of connectors on bottles. This disconnects all bottles at once and saves time by not having to move projectile racks to access bottles behind racks.

D Disconnect electrical connectors from six crew compartment AFES extinguishers.

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE) (CONTINUED)


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
1 2 3 4
FIRE DET
1 2 3 4 5 6
FIRE EXT
SCEA
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 1


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
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FIRE DET
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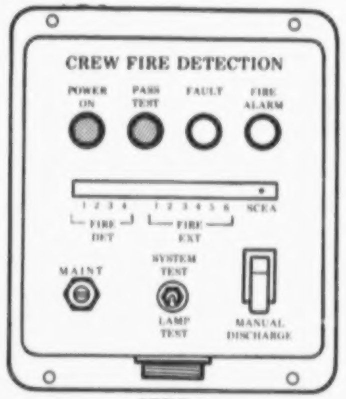
FIRE EXT
SCEA
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 2


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
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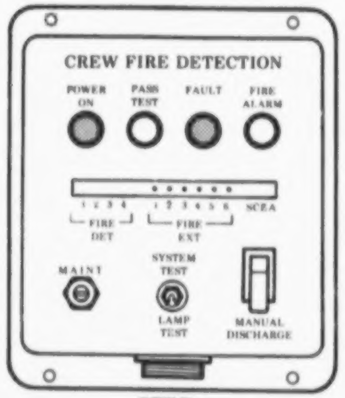
FIRE DET
1 2 3 4 5 6
FIRE EXT
SCEA
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 3


CREW FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
1 2 3 4
FIRE DET
1 2 3 4 5 6
FIRE EXT
SCEA
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

STEP 4

CREW FIRE DETECTION SYSTEM TEST (CONTINUED)

E Turn MASTER switch ON.

F Turn crew T/A panel MAINTenance switch to horizontal position. The following events will occur:

1. Crew T/A panel green POWER ON light, yellow FAULT light, and all red FIRE DET LED's will immediately illuminate and remain on.
2. After approximately 2 seconds, the yellow FAULT light and all red FIRE DET LED's will extinguish. The green POWER ON light will remain on.
3. After approximately 7 seconds, the green PASS TEST light will illuminate and remain on. At the same time, the red SCEA LED will briefly flash on one time.
4. After approximately 12 seconds, the green PASS TEST light will extinguish. When the PASS TEST light goes out, the yellow FAULT light and all six red FIRE EXT LED's will illuminate and remain on.

G Press LAMP TEST toggle switch down and check that all four lamps and 11 LED's are lit. Replace any lamp that is burned out. If any LED does not light, replace crew T/A panel (p 14-40).

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE) (CONTINUED)

CREW FIRE DETECTION SYSTEM TEST (CONTINUED)

WARNINGS

- If red FIRE ALARM lamp remains on, or flashes on and off after completion of self test, do not reconnect Halon bottles. Do not continue test.
- Make sure anti-recoil plugs are installed in crew AFES extinguisher discharge ports. Make sure extinguisher electrical connectors are disconnected (see steps A thru D).

H Lift red guard covering crew T/A panel MANUAL DISCHARGE toggle switch. Press toggle switch up to discharge position. The personnel ventilator system will automatically turn on in the exhaust mode 8 to 10 seconds after actuating system. If not, troubleshoot personnel ventilator blower system (p 2-177).

I Press ventilator blower RESET switch, located on accessory control panel, to shut off personnel ventilator blower.

J Lower red guard cover to cover MANUAL DISCHARGE switch.

K Turn crew T/A panel MAINTenance switch to vertical position.

L Turn MASTER switch OFF. Reconnect electrical connector(s) for all six crew system Halon bottles or, if optional method in note above is used, reconnect J2 connector at SCEA.

M Turn crew T/A panel MAINTenance switch to horizontal position. Turn MASTER switch ON. Light sequence on crew T/A panel shall repeat as in step F, except that when the green PASS TEST light goes out at the end of the BITE test, all six red FIRE EXT LED's will briefly flash on one time. The yellow FAULT light will not illuminate this time. After completion of the BITE test, the only light illuminated will be the green POWER ON light.

N Press SYSTEM TEST switch up to activate system test. The following light sequence will occur:

1 Crew T/A panel green POWER ON light will already be illuminated.

2 After approximately 5 seconds, the PASS TEST light will illuminate and remain on. At the same time, the red SCEA LED will briefly flash on one time.

CREW AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE) (CONTINUED)

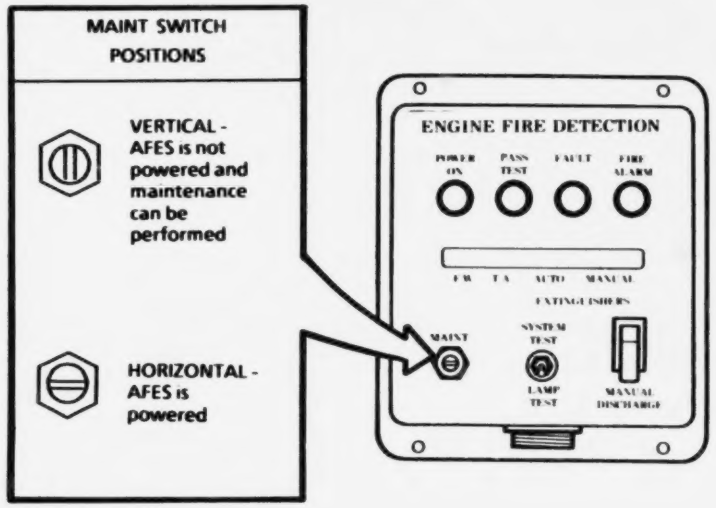
3 After approximately 10 seconds, the green PASS TEST light will extinguish. As the PASS TEST light goes out, all six red FIRE EXT LED's will briefly flash on one time. Upon completion of the system test, the only light illuminated will be the green POWER ON light.

O Turn MASTER switch OFF and observe crew T/A panel. Green POWER ON light will remain on. If not, troubleshoot crew fire detection system (p 2-306.18).

P Turn crew T/A panel MAINTenance switch to vertical position and observe crew T/A panel. All lights will go out. If not, troubleshoot AFES (p 2-306.18).

Q Turn crew T/A panel MAINTenance switch to horizontal position.

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE)


MAINT SWITCH POSITIONS
VERTICAL - AFES is not powered and maintenance can be performed
HORIZONTAL - AFES is powered
ENGINE FIRE DETECTION
POWER ON
PASS TEST
FAULT
FIRE ALARM
FW
TA
AUTO
MANUAL
EXTINGUISHERS
MAINT
SYSTEM TEST
LAMP TEST
MANUAL DISCHARGE

ENGINE FIRE DETECTION SYSTEM TEST

A Make sure all system components are connected.

B Turn MASTER switch OFF.

WARNING

If T/A panel POWER ON lamp does not go out when T/A panel MAINTenance switch is turned to vertical position, disconnect battery ground lead. DO NOT CONTINUE TEST. Troubleshoot AFES (p 2-306.1).

C Turn engine T/A panel MAINTenance switch to vertical position.

WARNING

Electrical connectors must be disconnected from AFES extinguisher actuators or discharge of Halon will occur during test.

D Disconnect two engine AFES bottles. Electrical connectors are located behind ammunition racks between personnel heater and ventilation blower.

E Turn MASTER switch ON.

F Turn engine T/A panel MAINTenance switch to horizontal position.

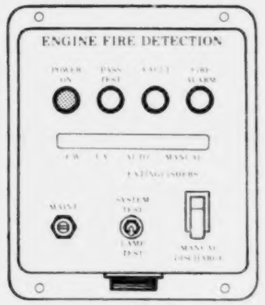
ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE) (CONTINUED)

Check for following sequence:

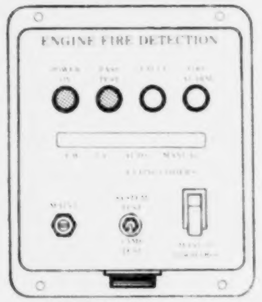
1 Green POWER ON light comes on immediately and stays lit.

2 Within 6 seconds, green PASS TEST light comes on.

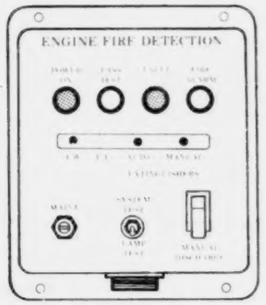
3 After a few more seconds, the PASS light should extinguish. When the PASS light goes out, the yellow FAULT light and the red LED for both MANUAL and AUTO extinguishers should illuminate and remain on. The red F/W LED may illuminate during the BITE test.



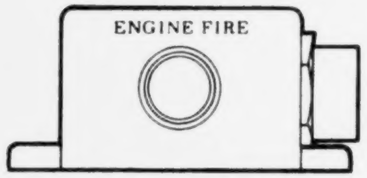
STEP 1



STEP 2



STEP 3



G Press LAMP TEST toggle switch down and check that all four lamps, four LED's and RSI come on. Replace any lamp that is burned out. If any LED does not light, replace engine T/A panel (p 14-39).

> **WARNING**
>
> If T/A panel POWER ON lamp does not go out when T/A panel MAINTenance switch is turned to vertical position, disconnect battery ground lead. DO NOT CONTINUE TEST. Troubleshoot AFES (p 2-306.2).

H Turn engine T/A panel MAINTenance switch to vertical position. All lights on engine T/A panel will go out.

I Turn MASTER switch OFF. Connect electrical connectors to engine AFES extinguisher bottle actuators.

ENGINE AUTOMATIC FIRE EXTINGUISHING SYSTEM TEST (VEHICLES 345 AND ABOVE) (CONTINUED)

J Turn MASTER switch ON. Turn engine T/A panel MAINTenance switch to horizontal position and observe panel lights. Sequence will be the same as in step F except MANUAL, AUTO and yellow FAULT light will not come on. If it does, troubleshoot engine fire detection system (p 2-306.2).

K Turn SYSTEM TEST/LAMP TEST switch on engine T/A panel to SYSTEM TEST position. Sequence will be as follows:

1 T/A LED flickers.

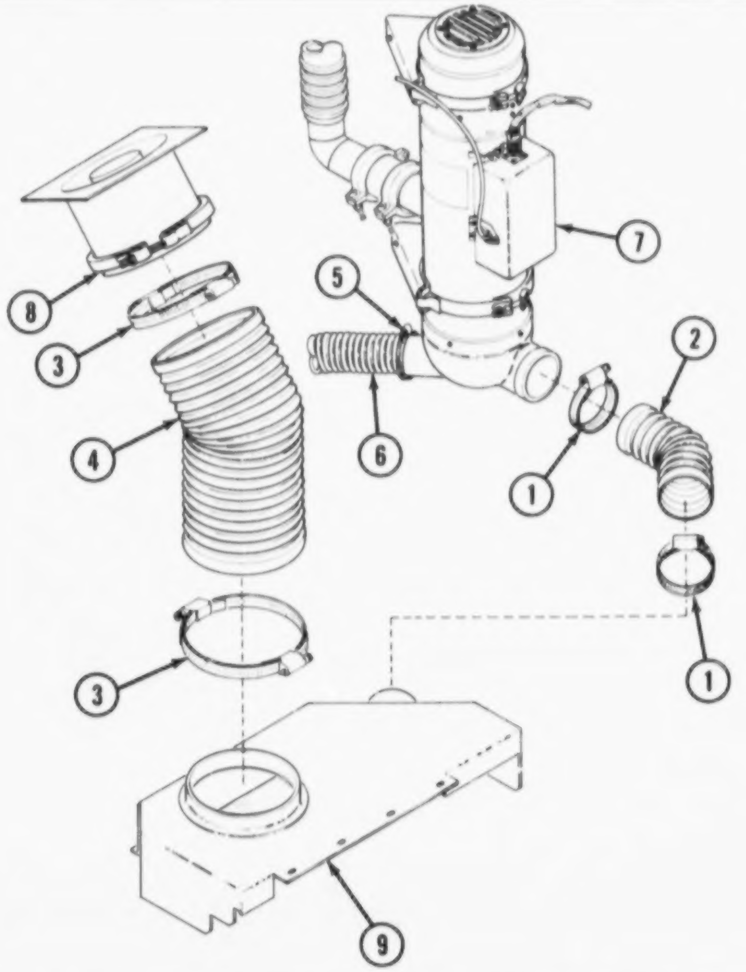
2 PASS TEST light and F/W LED come on for approximately 6 seconds and then go out.

L Turn MASTER switch OFF. Observe engine T/A panel lights. Green POWER ON lamp will remain lit. If not, troubleshoot engine fire detection system (p 2-306.2).

M Turn engine T/A panel MAINTenance switch to vertical position. All lights on engine T/A panel will be off.

N Turn engine T/A panel MAINTenance switch to horizontal position.

HEATING AND VENTILATING DISTRIBUTION HOSES: REMOVAL AND INSTALLATION



REMOVAL

A Remove fire extinguisher #1 and #3 support brackets (p 14-30).

B Loosen two clamps (1) on flexible hose (2) and remove hose.

NOTE

Clamps (3) are actually two identical small clamps joined end-to-end to clamp a larger hose.

C Remove two tandem clamps (3) releasing flexible hose (4).

D Loosen two clamps (5) releasing flexible hose (6).

INSTALLATION

A Secure flexible hose (6) to heater (7) and tee with two clamps (5).

B Secure flexible hose (4) to ventilation blower (8) and floor duct (9) with two tandem clamps (3).

NOTE

Clamps (3) are actually two identical small clamps joined end-to-end to clamp a larger hose.

C Secure flexible hose (2) to heater (7) and floor duct (9) with two clamps (1).

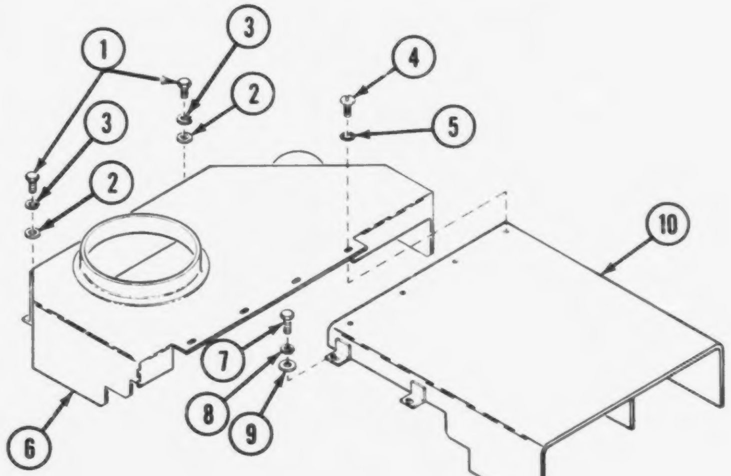
D Install #1 and #3 fire extinguisher support brackets (p 14-30).

E Install #1 and #3 fire extinguisher bottles (p 14-28).

TA313125

PERSONNEL VENTILATION BLOWER, HEATING AND VENTILATING HOSES AND DUCTS (CONTINUED)

HEATING AND VENTILATING DUCT AND HEAT SHIELDS



REMOVAL

A Remove flexible hoses from personnel heater and personnel ventilating fan (p 14-61).

B Remove two screws (1), two flat washers (2) and two lockwashers (3).

C Remove four screws (4), and four lockwashers (5).

D Remove duct (6).

E Remove four screws (7), four lockwashers (8) and four flat washers (9).

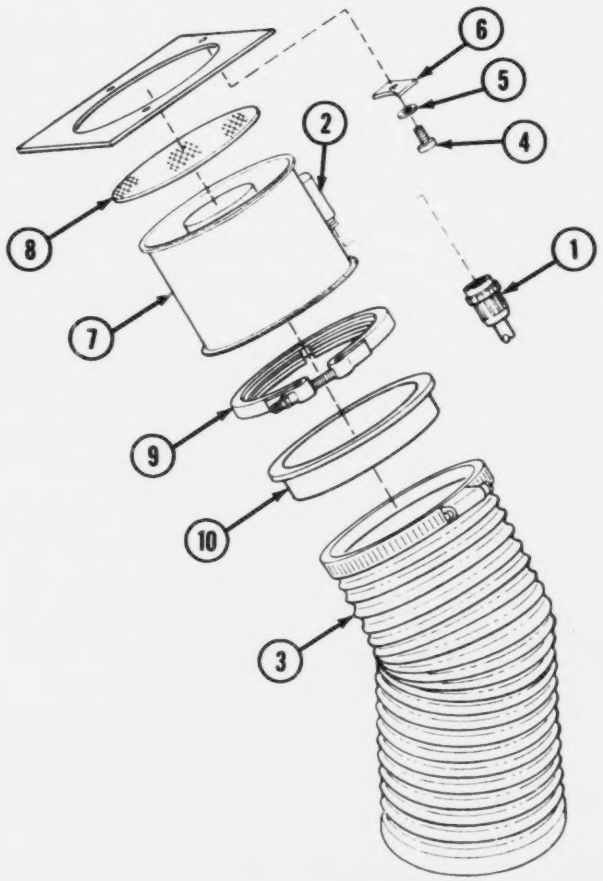
F Remove duct (10).

INSTALLATION

Reverse order of removal.

TA310736

PERSONNEL VENTILATION BLOWER: REMOVAL, CLEANING AND INSTALLATION



INITIAL SETUP

Materials/Parts:

Dry-cleaning solvent (item 19, Appx D)

References:

TM 9-2350-267-10

REMOVAL

A Remove fire extinguisher #1 and #3 support brackets (p 14-30).

B Disconnect electrical connector (1) at receptacle (2).

C Remove flexible hose (3) (p 14-61).

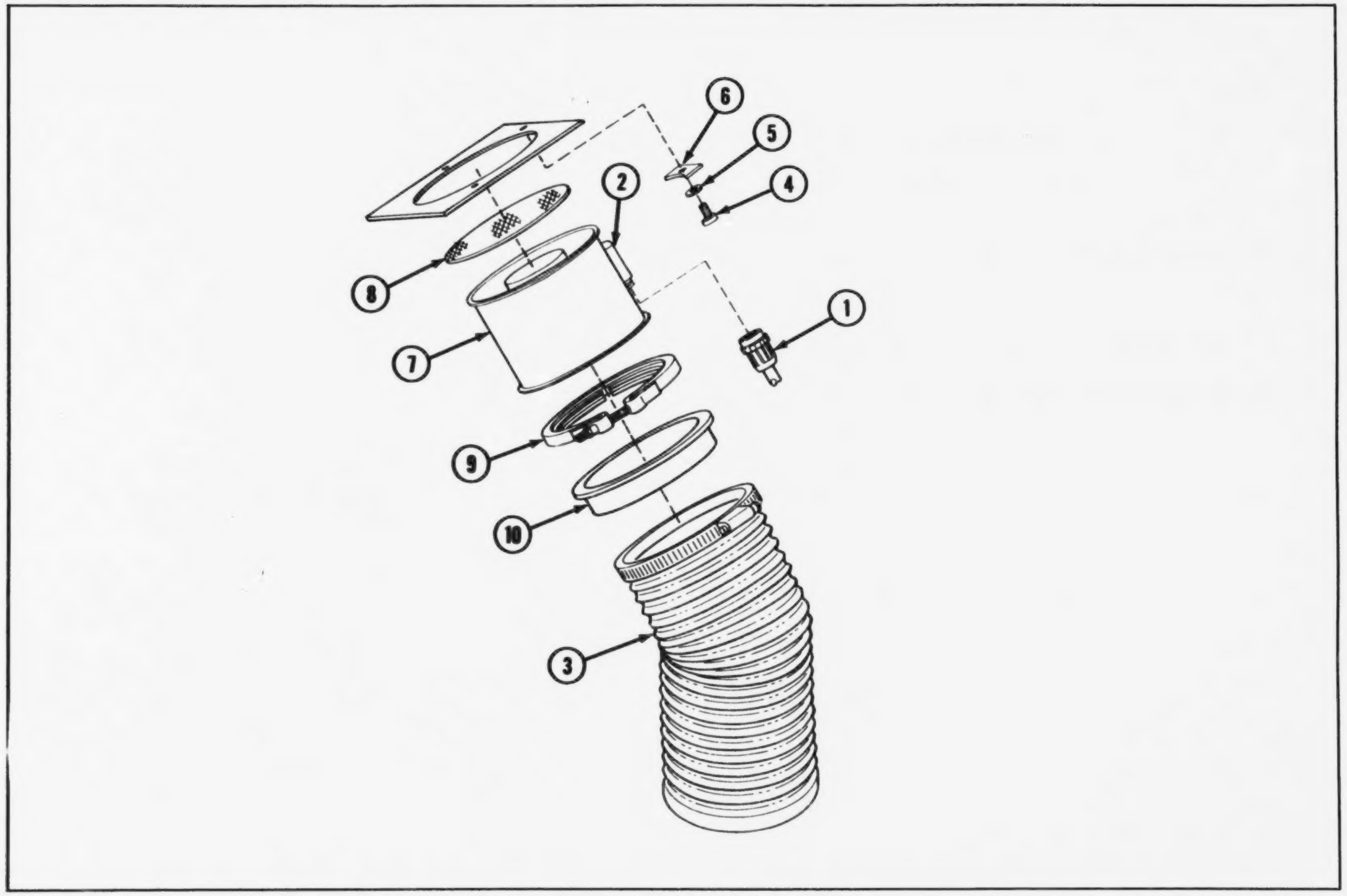
D Remove three screws (4), three flat washers (5) and three plates (6).

E Remove fan assembly (7) and screen (8).

F Open coupling (9) releasing connector (10).

TA313126

PERSONNEL VENTILATION BLOWER: REMOVAL, CLEANING AND INSTALLATION (CONTINUED)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TA313127

PERSONNEL VENTILATION BLOWER: REMOVAL, CLEANING AND INSTALLATAION (CONTINUED)

CLEANING

> **WARNING**
>
> Dry-cleaning solvent (PD-680) is toxic and flammable. To prevent personal injury when using PD-680, use only in a well ventilated area. Avoid breathing vapors. If you become dizzy get fresh air immediately and seek medical attention. Avoid contact with eyes, skin and clothing. Use protective goggles, gloves, and clothing. If contact is made, immediately flush with water and seek medical attention. The flashpoint for Type I dry-cleaning solvent is 100°F (38°C); for Type II it is 138°F (50°C). Do not use near open flame or excessive heat.

Clean screen (8) with dry-cleaning solvent (item 19, Appx D).

INSTALLATION

A Install connector (10) on motor end of fan assembly (7). Secure with coupling (9).

B Install screen (8) on fan assembly (7).

C Install fan assembly (7) on mounting surface of bulkhead with three plates (6), three flat washers (5) and three screws (4).

D Install flexible hose (3) (p 14-61).

E Connect electrical connector (1) to receptacle (2).

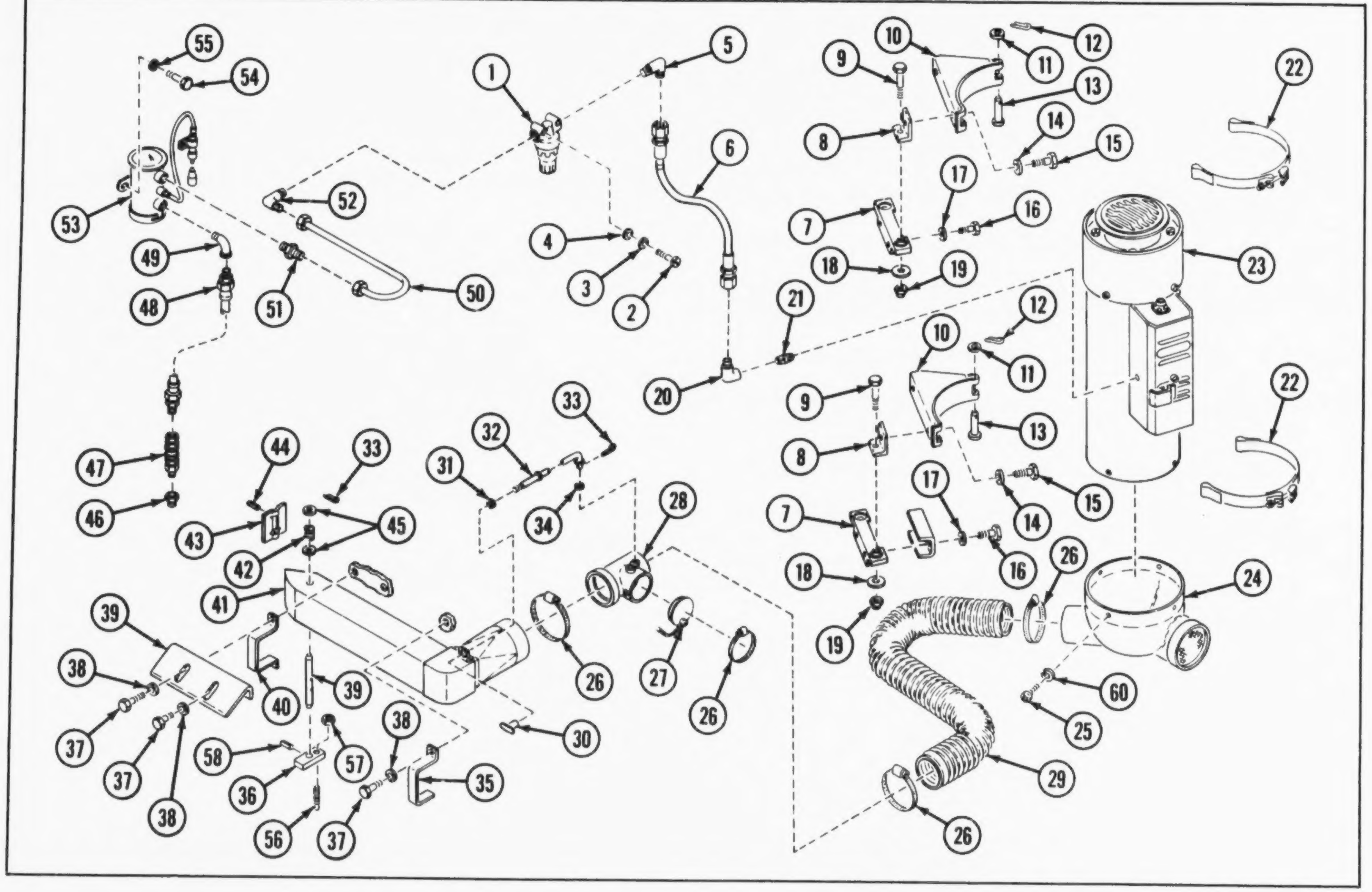
F Place MASTER switch in ON position. Check operation of personnel ventilation blower (TM 9-2350-267-10).

G Install fire extinguisher #1 and #3 support brackets (p 14-30).

H Install fire extinguisher bottles #1 and #3 (p 14-28).

TA313128

PERSONNEL HEATER MOUNTING CLAMP, SADDLE DUCTS, HOSES, TUBES AND DEFLECTORS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TA57515

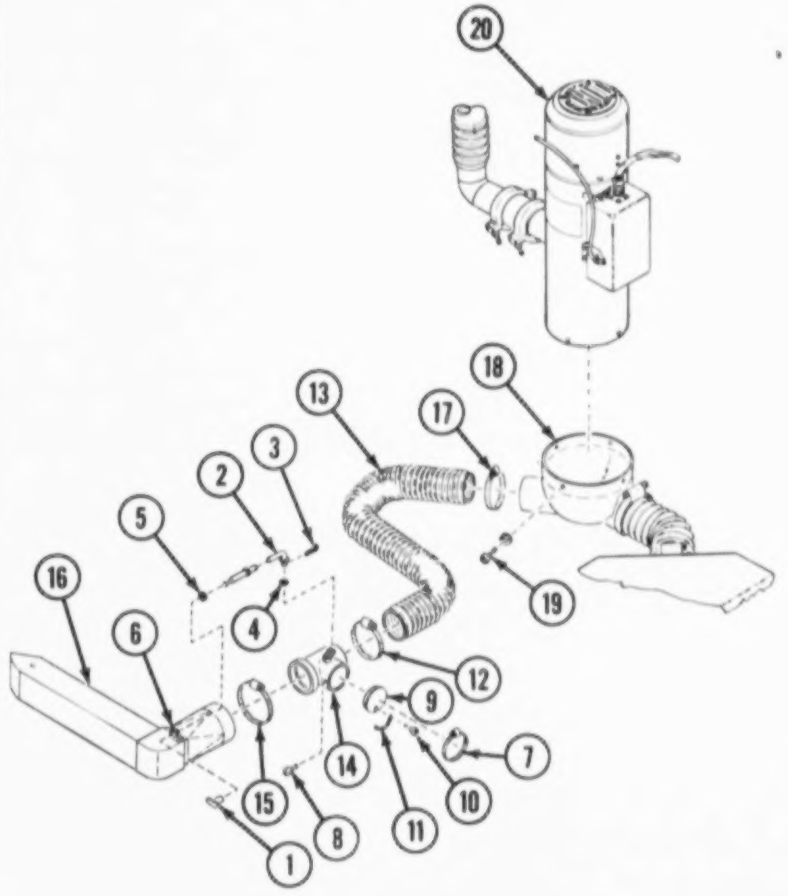
PERSONNEL HEATER MOUNTING CLAMP, SADDLE, DUCTS, HOSES, TUBES AND DEFLECTORS (CONTINUED)

LEGEND

1 Fuel filter
2 Screws (2)
3 Lockwasher (2)
4 Flat washer (2)
5 Elbow
6 Fuel filter to heater hose
7 Support assembly (2)
8 Angle bracket (4)
9 Screw (4)
10 Saddle bracket (2)
11 Flat washer (4)
12 Cotter pin (4)
13 Pin (4)
14 Flat washer (4)
15 Screw (4)
16 Screw (4)
17 Flat washer (4)
18 Flat washer (4)
19 Nut (4)
20 Elbow
21 Nipple
22 Clamp (2)
23 Personnel heater
24 Duct
25 Screw (4)
26 Clamp (4)
27 Cap assembly
28 Tee assembly
29 Hose
30 Handle
31 Grommet
32 Rod
33 Cotter pin (2)
34 Flat washer
35 Bracket
36 Outlet duct valve handle
37 Screw (4)
38 Flat washer (4)
39 Guard
40 Strap
41 Duct
42 Spring
43 Gate valve
44 Pin (2)
45 Flat washer (2)
46 Reducer
47 Coupling assembly
48 Hose assembly
49 Elbow
50 Tube assembly
51 Adapter
52 Elbow
53 Fuel pump
54 Screw (2)
55 Lockwasher (2)
56 Screw
57 Nut
58 Pin
59 Heater valve shaft
60 Lockwasher (4)

TA57516

PERSONNEL HEATER OUTLET HOSE, TEE ASSEMBLY AND CONTROLS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL

A Unscrew tee handle (1) from rod (2).

B Remove and discard cotter pin (3).

C Remove rod (2) and washer (4).

D Remove grommet (5) from bracket (6).

E Loosen clamp (7).

F Remove screw (8) and cap (9).

G Remove screw (10) and chain (11).

H Loosen clamp (12) and pull hose (13) from tee assembly (14).

I Loosen clamp (15) and remove tee assembly (14) from duct (16).

J Remove four screws (19).

K Remove duct (18) from personnel heater (20).

L Loosen clamp (17) and remove hose (13) from duct (18).

INSTALLATION

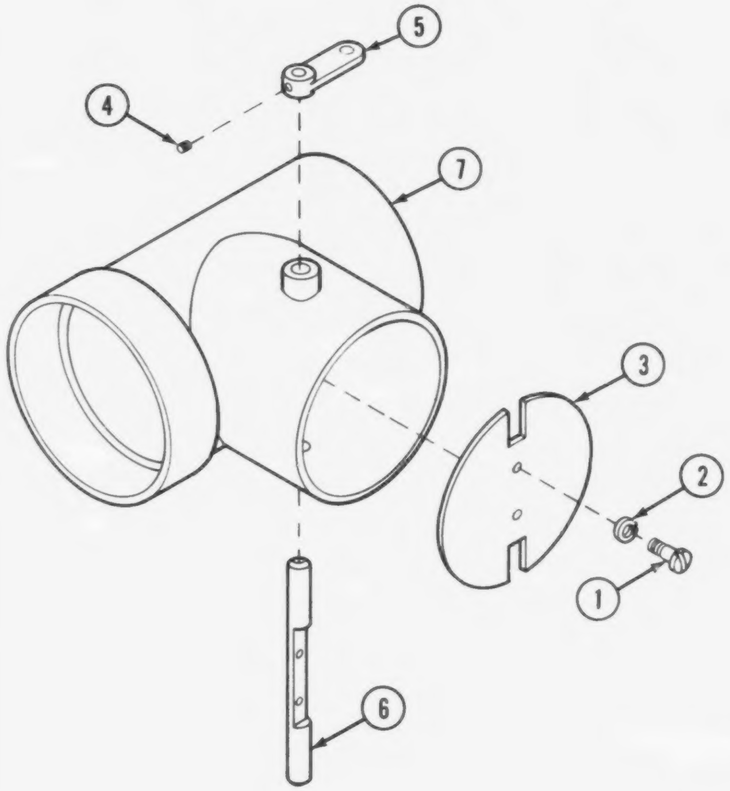
A Replace cotter pin (3).

B Reverse order of removal.

TA310740

PERSONNEL HEATER OUTLET HOSE, TEE ASSEMBLY AND CONTROLS: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

PERSONNEL HEATER OUTLET HOSE TEE ASSEMBLY



DISASSEMBLY

A Remove two screws (1) and two lockwashers (2).

B Remove baffle (3).

C Loosen setscrew (4) and remove arm (5).

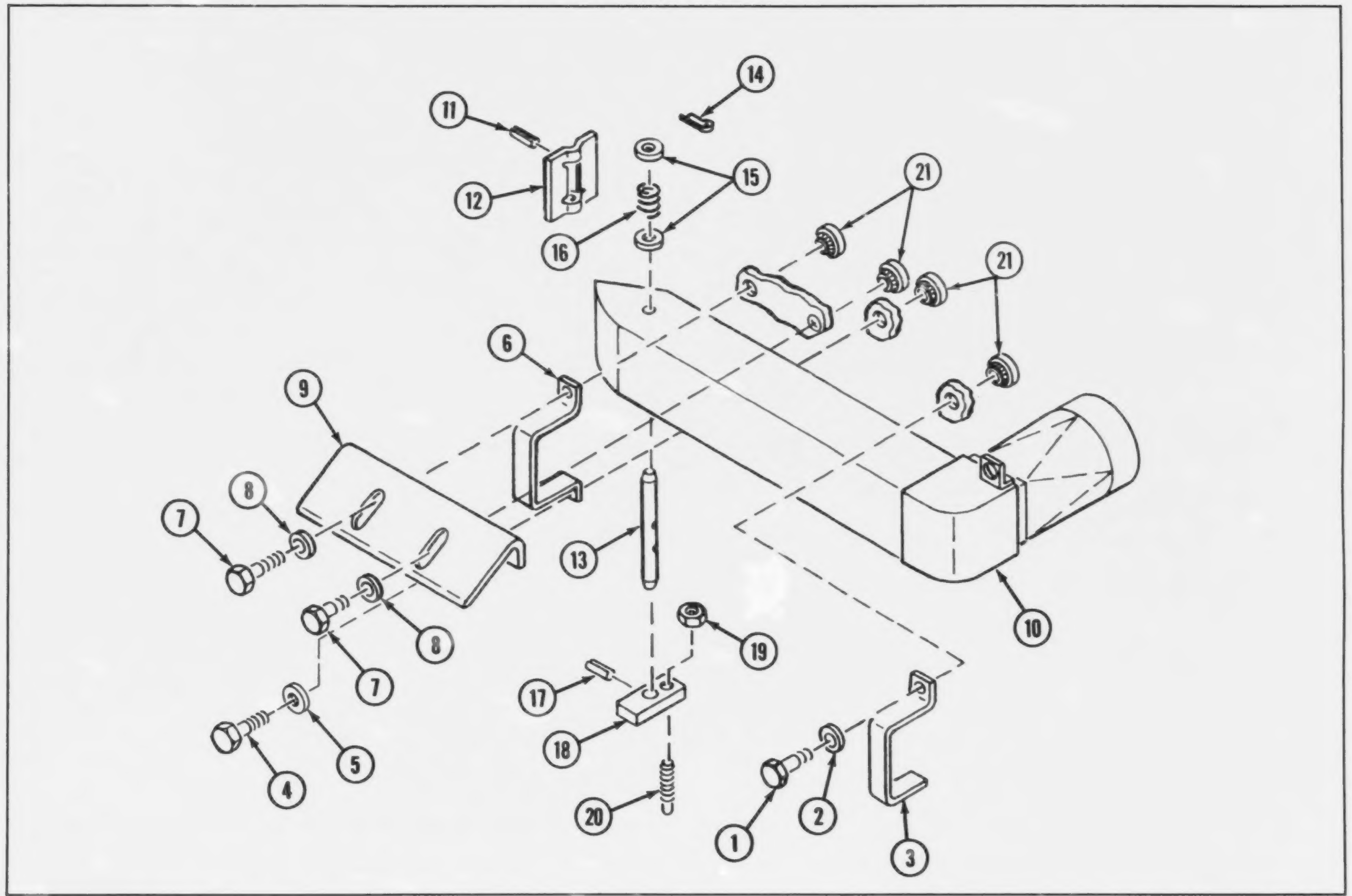
D Slide shaft (6) out of tee (7).

ASSEMBLY

Reverse order of disassembly.

TA310741

PERSONNEL HEATER DUCT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



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TA313129

PERSONNEL HEATER DUCT: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)

REMOVAL

A Remove personnel heater outlet hose tee (p 14-66).

B Remove screw (1) and flat washer (2) releasing bracket (3).

C Remove screw (4) and flat washer (5) from lower end of retaining strap (6).

D Remove two screws (7) and two flat washers (8) releasing retaining strap (6) and duct guard (9).

E Remove duct (10) and assembled parts.

DISASSEMBLY

A Drive out two spring pins (11) releasing valve (12) from shaft (13). Discard spring pins.

B Remove and discard cotter pin (14) releasing two flat washers (15) and spring (16).

C Drop shaft (13) and attached parts from duct releasing valve (12).

D Drive out and discard spring pin (17) releasing valve handle (18) and shaft (13).

E Remove jamnut (19) and detent screw (20) from handle (18).

ASSEMBLY

A Install handle (18) on shaft (13). Secure with new spring pin (17).

B Insert detent screw (20) in handle (18). Secure finger-tight with jamnut (19).

C Insert shaft (13) up through duct (10) and valve (12).

D Secure valve (12) to shaft (13) with two new spring pins (11).

E Install two flat washers (15) and spring (16) on top of shaft (13). Secure with new cotter pin (14).

F Check detent action of valve (12) and valve handle (18). Adjust detent screw (20). Lock in place with jamnut (19).

INSTALLATION

A Install personnel heater outlet hose tee assembly (p 14-66).

B Position duct (10) and assembled parts against driver/engine bulkhead. Aline holes in bracket (3), retaining strap (6) and duct guard (9) with holes in bulkhead.

NOTE

Splined nuts (21) are force-fit nested on engine side of bulkhead. If nuts have fallen out or are damaged, notify support maintenance.

C Position bracket (3) on duct (10). Secure with flat washer (2) and screw (1); finger tighten.

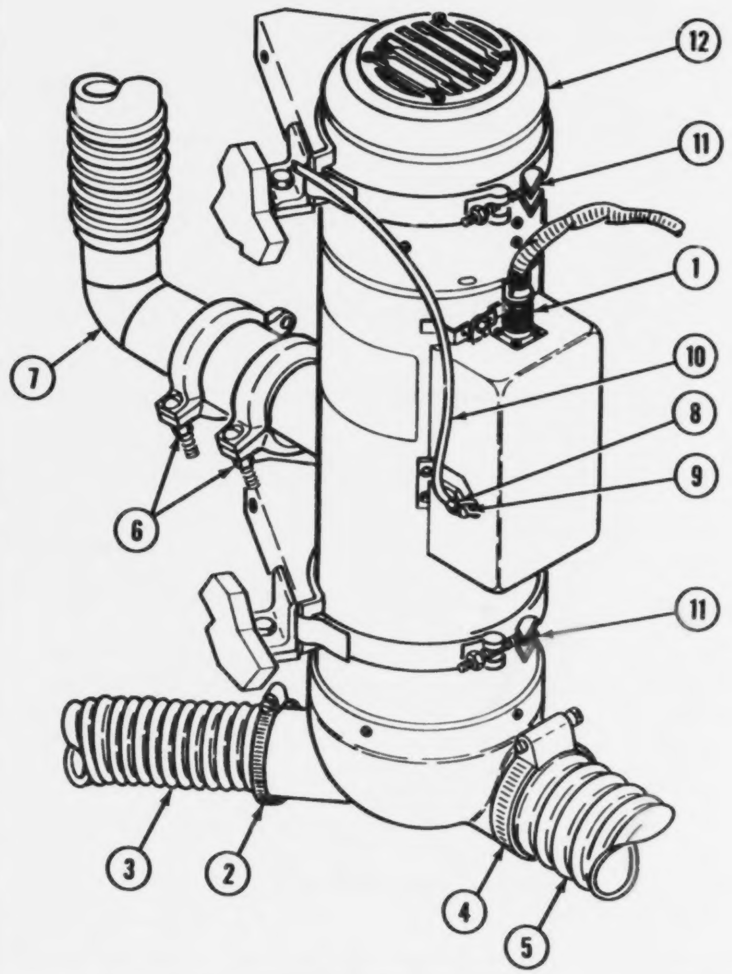
D Position strap (6) on duct (10). Secure bottom of strap (6) with flat washer (8) and screw (4); finger tighten.

E Position duct guard (9) and secure forward end and strap (6) with flat washer (8) and screw (7). Secure rear end of duct guard (9) with flat washer (8) and screw (7).

F Tighten screws (1, 4, and 7). Make sure splined nuts (21) are secure.

TA313130

PERSONNEL HEATER: REMOVAL AND INSTALLATION



REMOVAL

A Remove fire extinguisher mountings #1 and #3 (p 14-30).

B Disconnect electrical connector (1).

C Loosen clamp (2) and disconnect hose (3).

D Loosen clamp (4). Disconnect hose (5).

E Loosen two nuts (6) and remove exhaust tube (7).

NOTE

Use a suitable container to catch a few ounces of fuel which should drain from fuel line.

F Unscrew nut (8) from elbow (9). Remove fuel line (10). Catch drained fuel.

G Loosen two clamps (11).

H Remove personnel heater (12).

TA313131

PERSONNEL HEATER: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

A Position personnel heater (12) and secure with two clamps (11).

B Screw nut (8) out of elbow (9) to connect fuel line (10).

WARNING

Exhaust piping seals in carbon monoxide. Any leaks could endanger vehicle crew.

C Install exhaust tube (7) with two nuts (6).

D Connect hose (5). Secure clamp (4).

E Connect hose (3). Secure clamp (2).

F Connect electrical connector (1).

WARNING

In case of fire, AFES system must be manually activated.

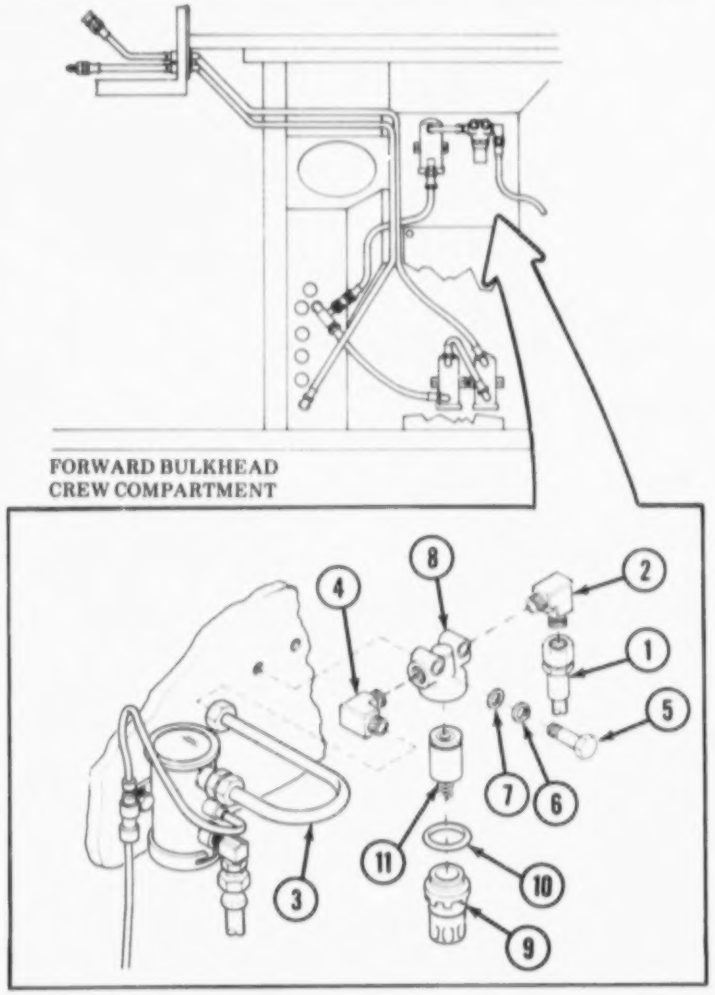
G Check operation of personnel heater (TM 9-2350-267-10).

H Install fire extinguisher mountings #1 and #3 (p 14-30).

I Install fire extinguisher bottles #1 and #3 (p 14-28).

TA313132

HEATER FUEL FILTER AND TUBES: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



INITIAL SETUP

Materials/Parts:

Teflon tape (item 60, Appx D)

REMOVAL

A Remove fire extinguisher mountings #1 and #3 (p 14-30).

NOTE

When opening fuel system, use a suitable container to catch a few ounces of fuel.

B Disconnect personnel heater fuel inlet hose (1) at elbow (2).

C Disconnect fuel pump to filter tube (3) at elbow (4).

D Remove two screws (5), two lockwashers (6), two flat washers (7) and fuel filter head (8) with attached parts. Discard lockwashers.

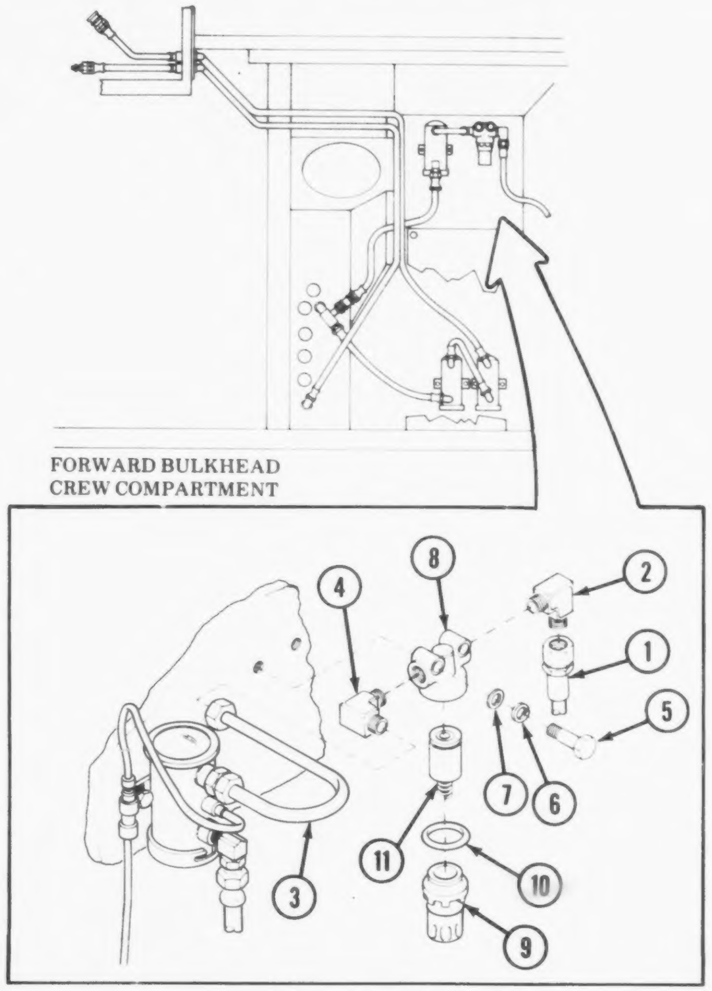
E Remove elbows (2 and 4) from filter head (8).

DISASSEMBLY

Unscrew bowl (9), releasing preformed packing (10) and filter element (11). Discard packing.

TA313133

HEATER FUEL FILTER AND TUBES: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



ASSEMBLY

A Insert filter element (11) in bowl (9), spring end down.

B Moisten new preformed packing (10) with fuel and install.

C Install bowl (9) on filter head (8).

INSTALLATION

NOTE

Apply Teflon tape (item 60, Appx D) to all threads of elbows.

A Install elbows (2 and 4) into filter head (8).

B Install filter head (8) with two screws (5), two lockwashers (6) and two flat washers (7).

C Connect fuel pump to filter tube (3) to elbow (4).

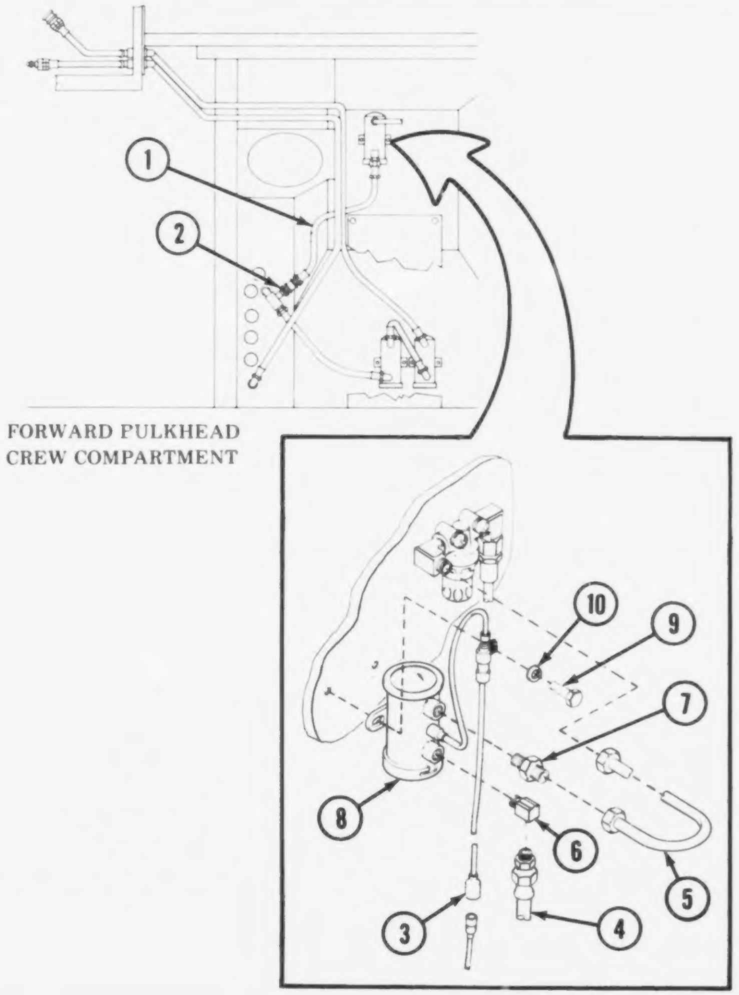
D Connect heater fuel inlet hose (1) to elbow (2).

E Install fire extinguisher mountings #1 and #3 (p 14-30).

F Install fire extinguisher bottles #1 and #3 (p 14-28).

TA313134

HEATER FUEL PUMP: REMOVAL AND INSTALLATION



REMOVAL

A Remove fire extinguisher #1 and #3 support brackets (p 14-30).

NOTE

When disconnecting fuel lines, use suitable container to catch excess fuel.

B Disconnect fuel inlet hose quick-disconnect (1) at tee (2).

C Disconnect electrical connector (3).

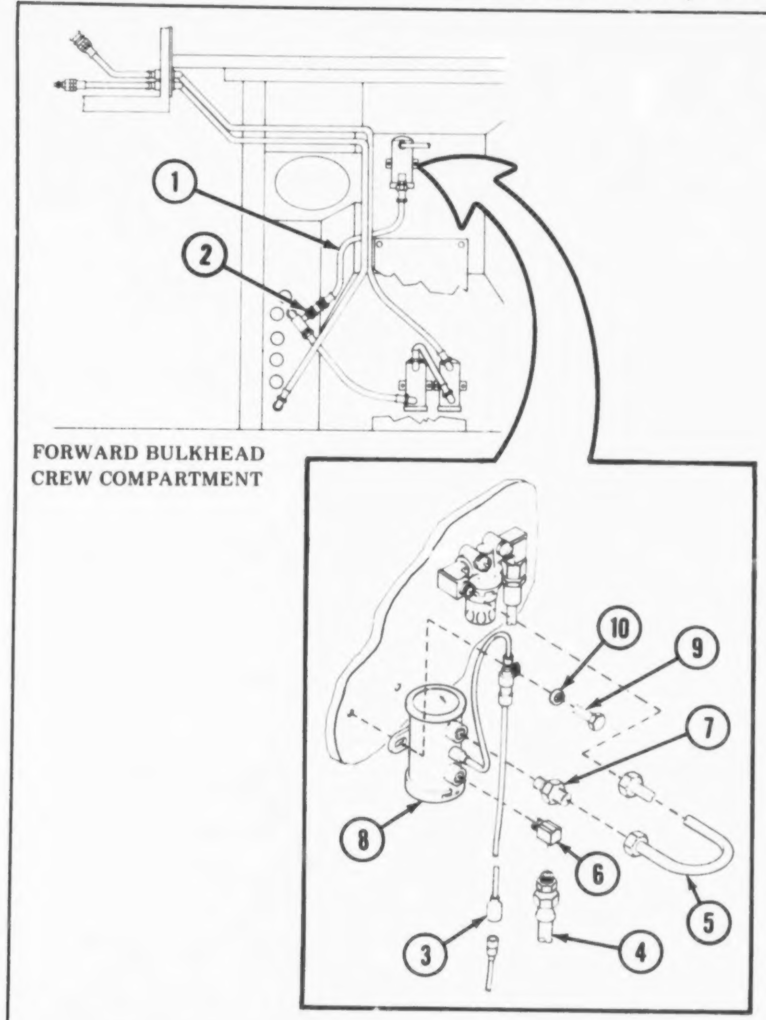
D Disconnect fuel inlet hose (4) and fuel pump to fuel filter tube (5) at fuel pump adapters (6 and 7).

E Remove fuel pump (8) by removing two screws (9) and two lockwashers (10). Discard lockwashers.

F Remove adapters (6 and 7).

TA313135

HEATER FUEL PUMP: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Install adapters (6 and 7).

B Install fuel pump (8) with two screws (9) and two new lockwashers (10).

C Connect fuel inlet hose (4) and fuel pump to fuel filter tube (5) at fuel pump adapters (6 and 7).

D Connect electrical connector (3).

E Install fuel inlet hose quick-disconnect (1) at tee (2).

F Install fire extinguisher support brackets #1 and #3 (p 14-30).

G Install fire extinguisher bottles #1 and #3 (p 14-28).

TA313136

PERSONNEL HEATER MOUNTING CLAMPS AND BRACKETS: REMOVAL AND INSTALLATION

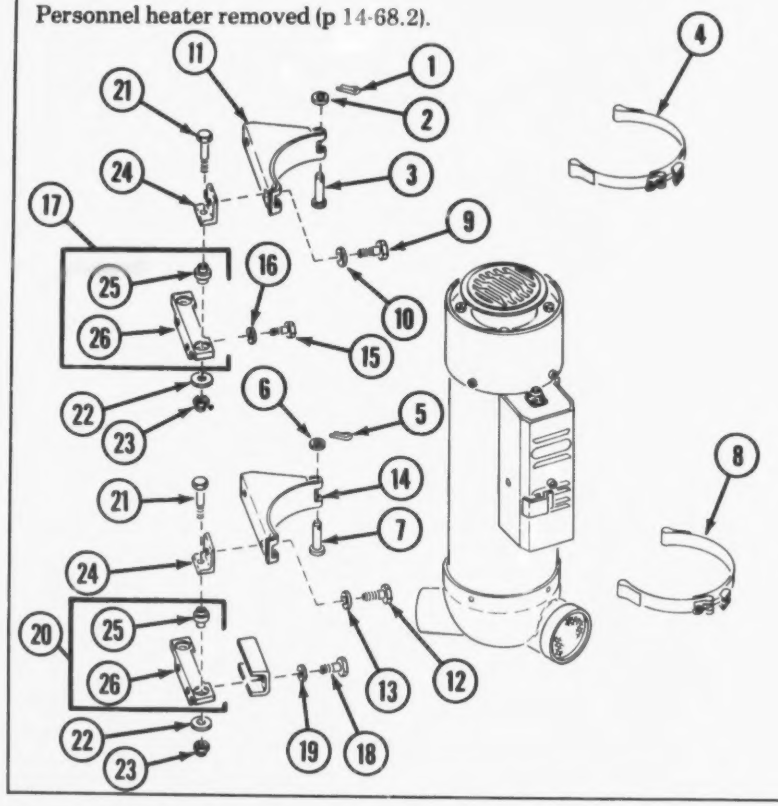
INITIAL SETUP

Personnel Required:

Two

Equipment Condition:

Personnel heater removed (p 14-68.2).



REMOVAL

A Remove two cotter pins (1), two flat washers (2), two straight pins (3) and upper clamp (4). Discard cotter pins.

B Remove two cotter pins (5), two flat washers (6), two straight pins (7) and lower clamp (8). Discard cotter pins.

C Remove two screws (9), two flat washers (10) and upper saddle bracket (11).

D Remove two screws (12), two flat washers (13) and lower saddle bracket (14).

NOTE

Removal of support assemblies requires removal of powerpack (p 3-1). Support assembly removal should be scheduled when powerpack is removed for another task.

E Remove powerpack (p 3-1).

F Remove two screws (15), two flat washers (16) and upper support assembly (17).

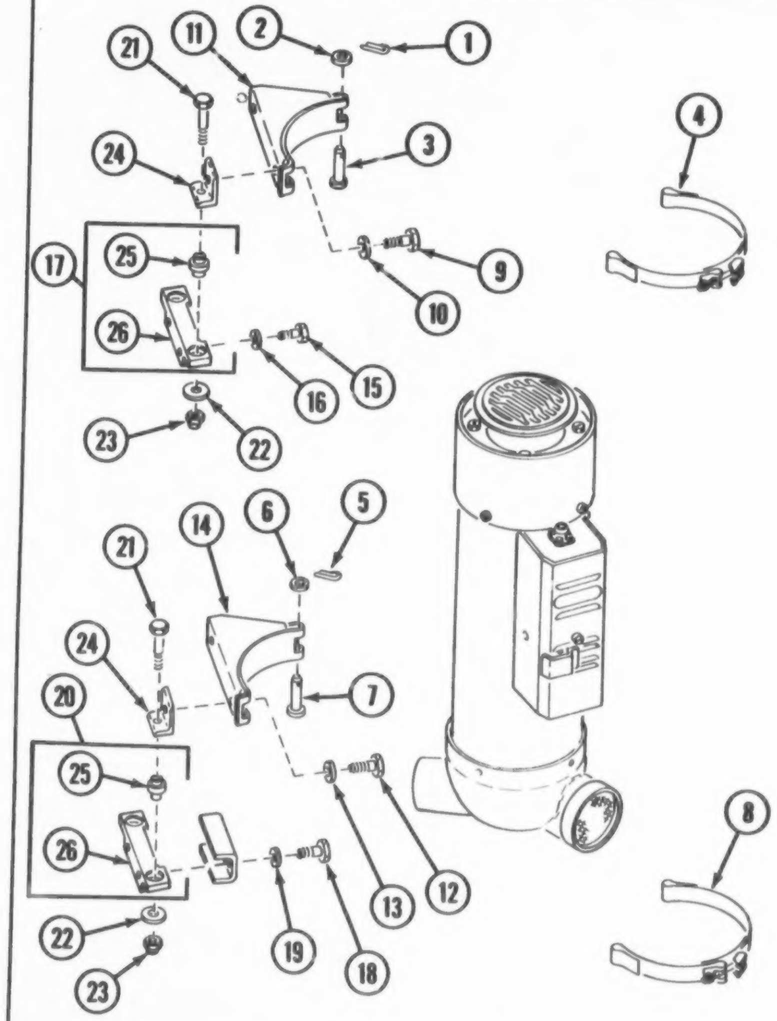
G Remove two screws (18), two flat washers (19) and lower support assembly (20).

H Remove four screws (21), four flat washers (22), four nuts (23) and four angles (24) from two support assemblies (17 and 20).

I Remove four resilient mounts (25) from two supports (26).

TA313137

PERSONNEL HEATER MOUNTING CLAMPS AND BRACKETS: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Insert four resilient mounts (25) in two supports (26).

B Secure four angles (24) on two support assemblies (17 and 20) with four screws (21), four flat washers (22) and four nuts (23).

C Install lower support assembly (20) with two flat washers (19) and two screws (18), finger tighten.

D Install upper support assembly (17) with two flat washers (16) and two screws (15), finger tighten.

E Install lower saddle bracket (14) with two flat washers (13) and two screws (12).

F Install upper saddle bracket (11) with two flat washers (10) and two screws (9).

G Tighten four nuts (23) and four screws (21).

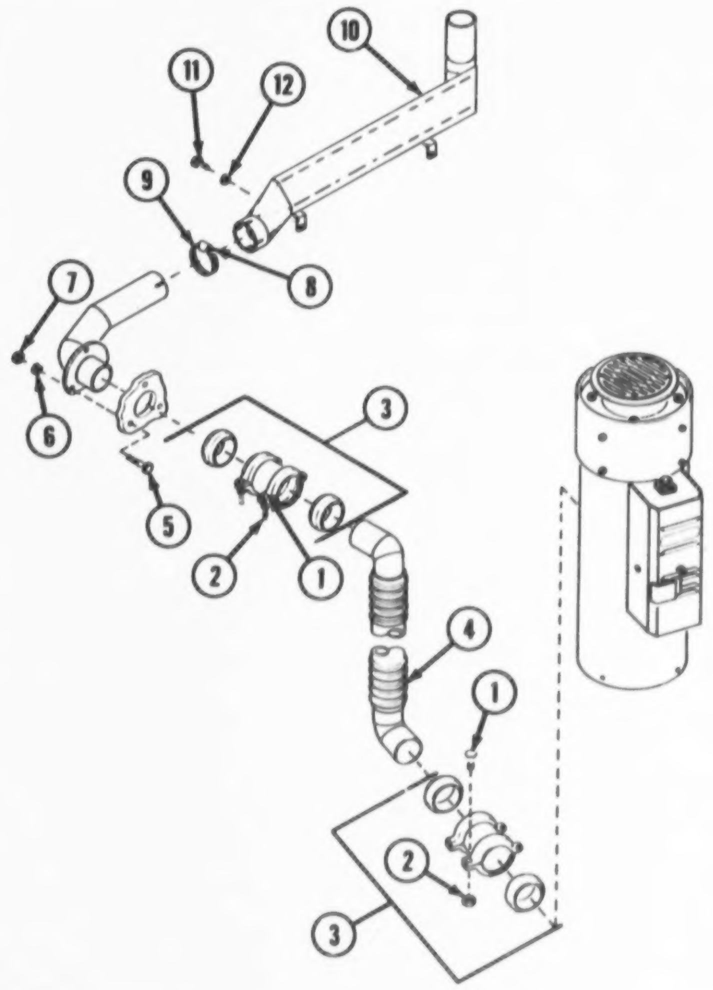
H Install powerpack (p 3-1).

I Install lower clamp (8) with two straight pins (7), two flat washers (6) and two new cotter pins (5).

J Install upper clamp (4) with two straight pins (3), two flat washers (2), and two new cotter pins (1).

TA313138

EXHAUST TUBE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION



REMOVAL/DISASSEMBLY

A Loosen four screws (1) and four nuts (2).

NOTE

Clamp assemblies consist of two gaskets with retainers, two clamps and sleeve.

B Remove two clamp assemblies (3).

C Remove hose assembly (4).

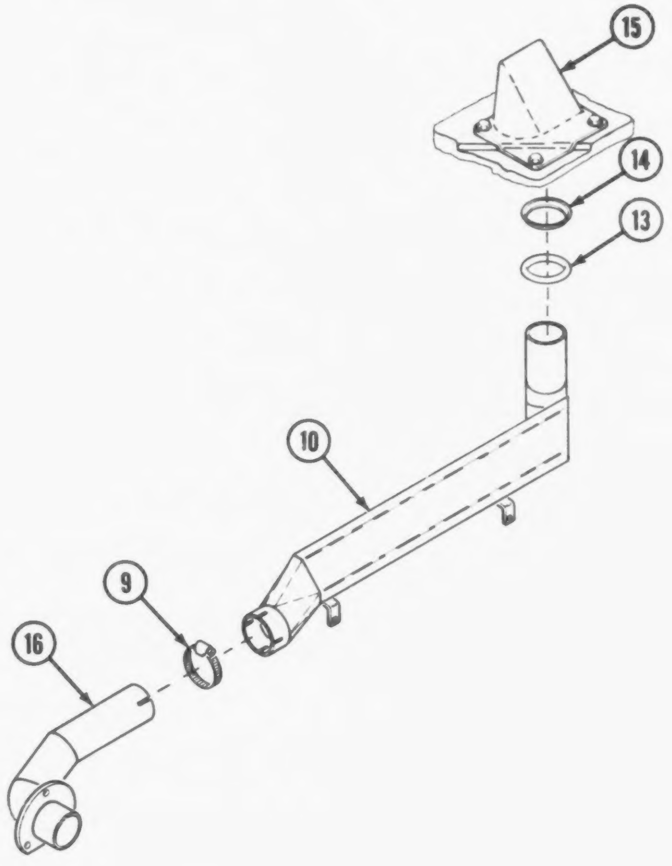
D Remove three screws (5), three lockwashers (6) and three nuts (7).

E Loosen screw (8) and slide clamp (9) off of tube (10).

F Remove two screws (11) and two lockwashers (12).

TA310746

EXHAUST TUBE: REMOVAL, DISASSEMBLY, ASSEMBLY AND INSTALLATION (CONTINUED)



G Pull tube (10), special washer (13) and preformed packing (14) away from exhaust deflector (15).

H Discard special washer (13) and preformed packing (14).

I Remove clamp (9) from tube (16).

ASSEMBLY/INSTALLATION

A Replace special washer (13) and preformed packing (14).

B Reverse order of disassembly.

C Reverse order of removal.

D Torque four clamp screws (1) to 65-75 lb-in.

TA310747

Section V BILGE PUMP

BILGE PUMP AND STRAINER: REMOVAL AND INSTALLATION

INITIAL SETUP

Test Equipment/Special Tools:

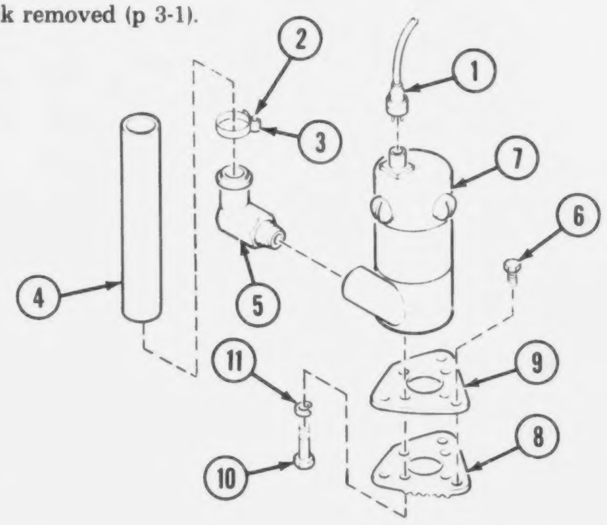
Pipe wrench, 10 in. (item 72, Appx B)

Materials/Parts:

Anti-seize compound (item 69, Appx D)
Sealing compound (item 52, Appx D)

Equipment Condition

Powerpack removed (p 3-1).



REMOVAL

A Remove electrical connector (1).

B Loosen screw (2) and remove clamp (3) and hose (4) from elbow (5).

NOTE

Note position of bilge pump before removal to ensure proper installation.

C Remove three screws (6) and remove bilge pump (7) from vehicle.

D Remove elbow (5) from bilge pump (7).

E Remove strainer (8) and stiffener (9) from bilge pump (7) by removing four screws (10) and four lockwashers (11). Discard lockwashers.

TA313139

BILGE PUMP AND STRAINER: REMOVAL AND INSTALLATION (CONTINUED)

INSTALLATION

NOTE

If new bilge pump is to be installed shipping spacers must be removed from screws (10).

A Install stiffener (9) and strainer (8) on bilge pump (7) with four screws (10) and four new lockwashers (11).

B Apply anti-seize compound (item 69, Appx D) to threads of elbow (5) and install in pump (7).

C Apply sealing compound (item 52, Appx D) to threads of three screws (6).

D Install bilge pump (7) in vehicle with three screws (6).

E Install hose (4) on elbow (5) and secure by tightening screw (2) on clamp (3).

F Install electrical connector (1).

TA313140

CHAPTER 15
MAINTENANCE PROCEDURES WINTERIZATION KIT

CHAPTER OVERVIEW

This chapter illustrates and describes procedures for removal, disassembly, assembly and installation of the M992 Winterzation Kit.

GENERAL INSPECTION AND REPAIR PROCEDURES

The mechanic will perform visual inspection of winterization kit components during installation. Look for the following conditions and take appropriate indicated actions:

- Cracked, damaged or deteriorated hoses, tubes and ducts.

  Replace or notify Support Maintenance as appropriate.

- Leaks at fuel line and coolant line connectors.

  Repair or replace as appropriate or notify Support Maintenance as required.

- Signs of burns, heat discoloration or damaged winterization kit housing and components.

  Notify Support Maintenance.

- Damaged electrical leads and connectors.

  Repair, replace or notify Support Maintenance as appropriate.

- Torn, deteriorated or damaged tarpaulins and tiedown straps.

  Repair or replace as appropriate.

TA310279

ENGINE AND BATTERY WINTERIZATION KIT

NOTE

The following installed view of the winterization kit identifies all items in kit. Those items which only need to be disconnected during powerpack removal are identified by a single *. Those items that need to be removed during powerpack removal are identified by a **.

LEGEND:

1 Connector wire (459B) to master switch
2 Receptacle at driver's compartment bulkhead
* 3 Bulkhead to heater, fuel-pump and coolant-pump harness (wires 402B, 402C, 403B, 403C, 406 and ground)
4 Battery insulation box
5 Battery heater plate parts
6 Exhaust outlet plug
7 Exhaust outlet
8 Transmission left access door
** 9 Exhaust tube
*10 Heater-to-surge tank hose connector tube
*11 Fuel pump-to-heater fuel tank
**12 Coolant heater
**13 Fuel pump (electric)
**14 Fuel filter-to-fuel pump fuel tube
**15 Fuel filter
*16 Engine fuel strainer (primary fuel filter) to fuel filter fuel hose
**17 Coolant pump (electric)
18 Engine coolant surge tank hose
19 Coolant pump-to-heater hose
*20 Engine coolant manifold-to-battery heater inlet hose
21 Engine manifold
22 Engine fuel strainer (primary filter)
23 Heater lead (wire 400)
24 Heater control box
25 Control box-to-master switch and bulkhead harness (wires 400, 402B, 402C, 406 and 459B)
26 Master switch (reference)
*27 Battery heater outlet-to-coolant pump hose
28 Heater hose-to-surge tank hose Y-connector tube
29 Engine fuel strainer (primary filter) to engine fuel tube
*30 Fuel tank to engine fuel strainer (primary filter) hose

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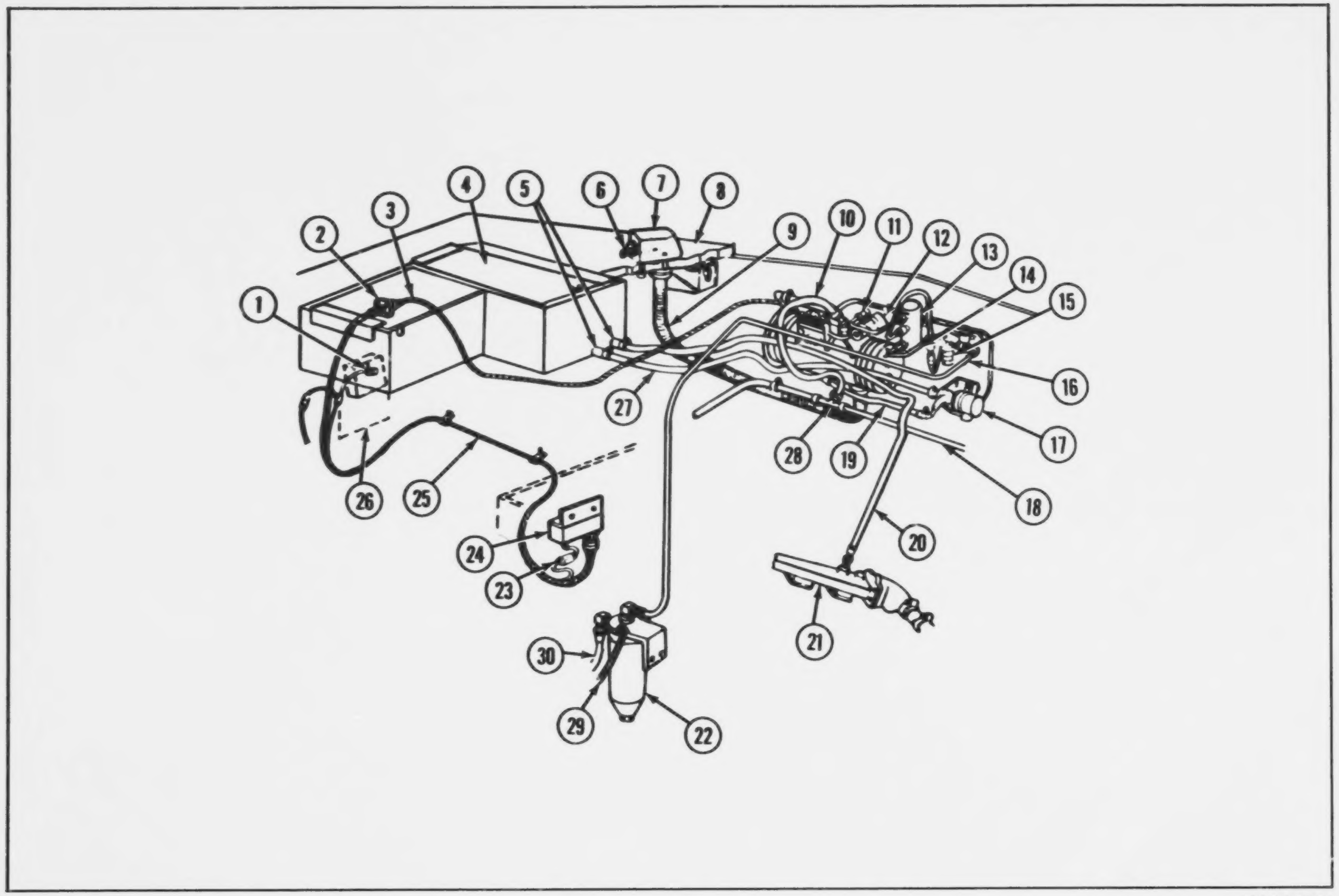
ENGINE AND BATTERY WINTERIZATION KIT (CONTINUED)



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TA310281

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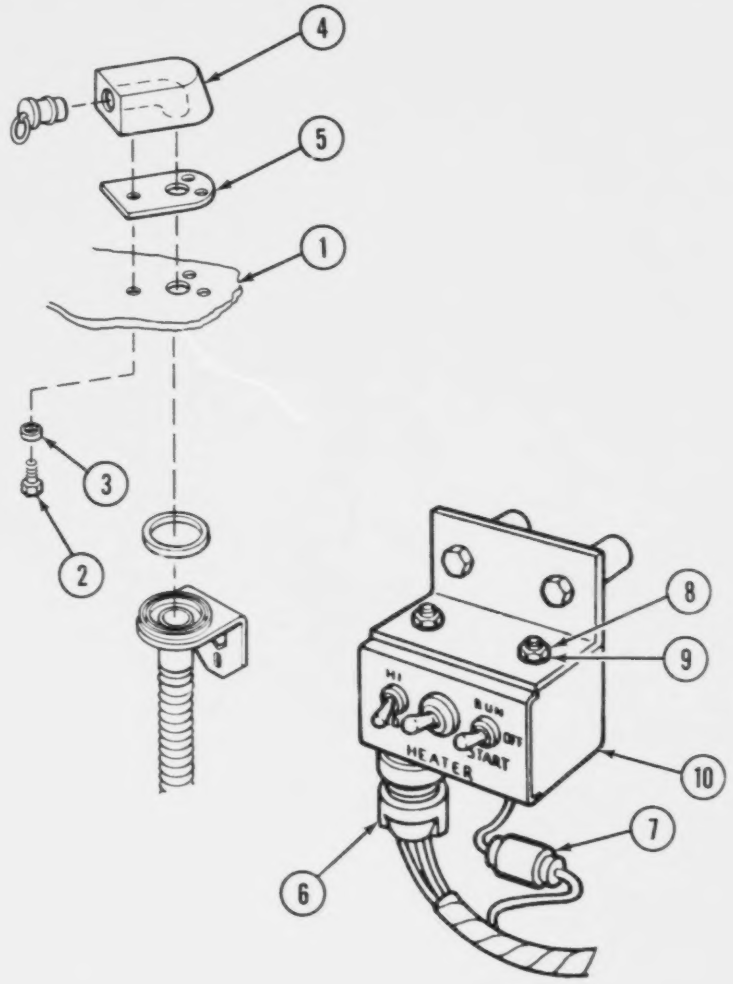
EXHAUST OUTLET ASSEMBLY AND HEATER CONTROL BOX: REMOVAL AND INSTALLATION



REMOVAL

A Open left transmission access door (1).

B Remove three screws (2), three flat washers (3), exhaust outlet (4) and gasket (5).

C Disconnect two electrical connectors (6 and 7).

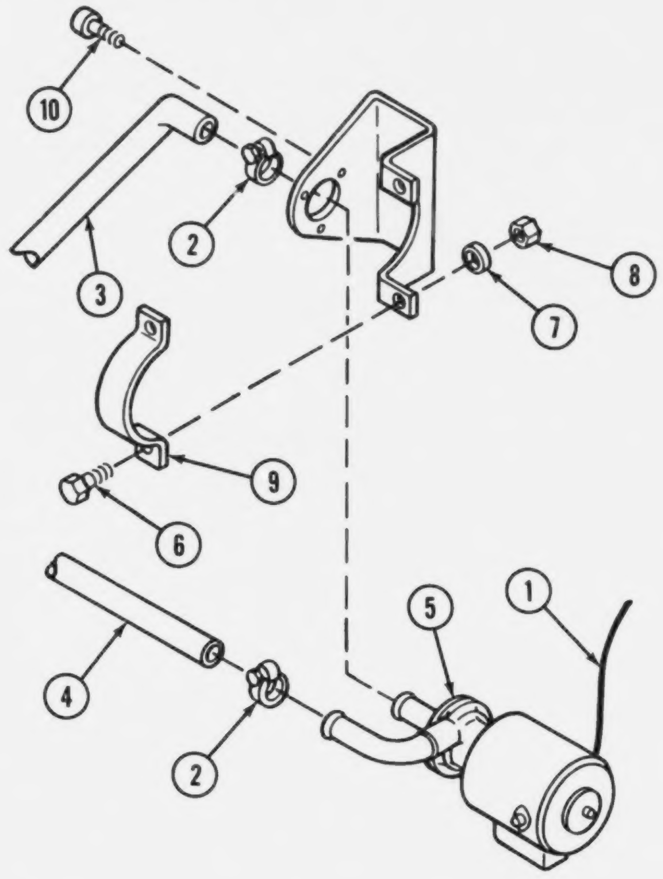
D Remove two nuts (8), two lockwashers (9) and control box (10).

INSTALLATION

Reverse order of removal procedures.

TA310282

COOLANT PUMP: REMOVAL AND INSTALLATION



REMOVAL

A Disconnect electrical lead (1).

B Loosen two hose clamps (2).

C Disconnect coolant inlet hose (3) and outlet hose (4) from pump (5).

NOTE

Install 5/8-inch plugs in hoses (3 and 4). If plugs are unavailable, drain coolant system (TM 9-2350-267-10).

D Remove two screws (6), two flat washers (7), two nuts (8) and clamp (9).

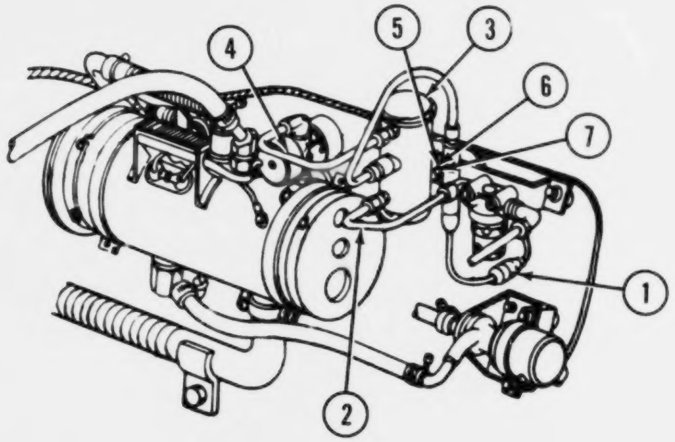
E Remove three screws (10) and coolant pump (5).

INSTALLATION

Reverse order of removal procedures.

TA310283

FUEL PUMP: REMOVAL AND INSTALLATION



REMOVAL

NOTE

Disconnect fuel inlet to fuel tank hose quick-disconnect at engine primary fuel filter (p 4-11).

A Disconnect electrical connector (1).

B Disconnect fuel filter to fuel pump tube (2) from fuel pump (3).

C Disconnect fuel pump to heater tube (4) at fuel pump (3).

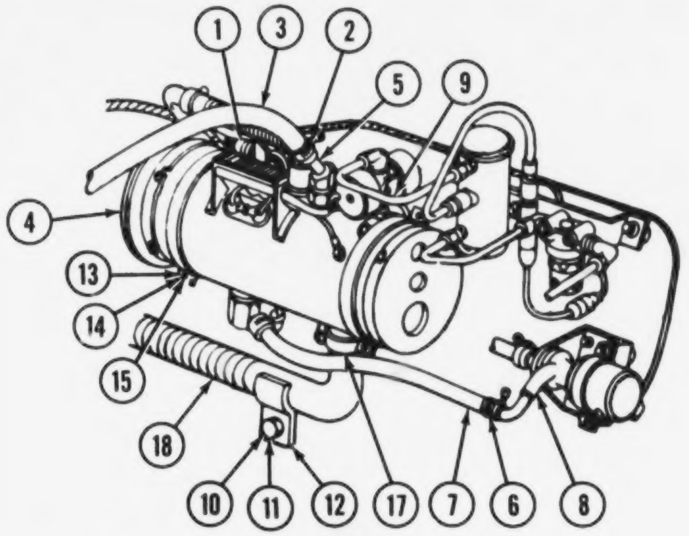
D Remove two nuts (5), two lockwashers (6), two flat washers (7) and fuel pump (3).

INSTALLATION

Reverse order of removal procedures.

TA310284

COOLANT HEATERS: REMOVAL AND INSTALLATION



NOTE

Disconnect fuel inlet to fuel tank hose quick-disconnect at engine primary fuel filter (p 4-11).

REMOVAL

A Disconnect wiring harness coolant heater plug (1).

B Loosen clamp (2) and disconnect hose (3) from coolant heater (4).

NOTE

Install 5/8-inch plug in hose (3). If no plug is available, coolant system must be drained (TM 9-2350-267-10).

C Install short 5/8-inch outside diameter hose on coolant hose outlet (5) and plug with 5/8-inch outside diameter plug.

D Loosen clamp (6) and disconnect hose (7) from coolant pump (8).

NOTE

Install two 5/8-inch plugs in inlet hose (7) and coolant pump (8).

E Disconnect fuel pump to coolant heater tube (9).

F Remove screw (10), lockwasher (11) and clamp (12).

G Remove four screws (13), four nuts (14), four flat washers (15) and remove two brackets (16).

NOTE

Lift heater unit to reach clamp (17).

H Loosen clamp (17) and disconnect heater exhaust hose (18).

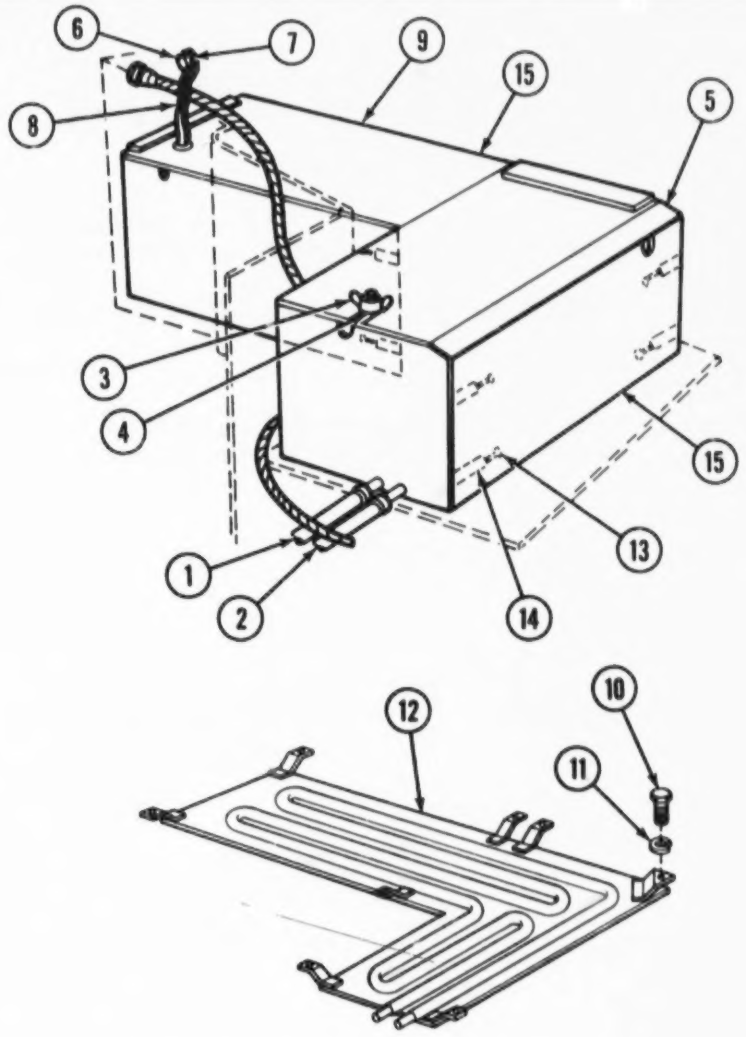
I Remove coolant heater (4) from vehicle.

INSTALLATION

Reverse order of removal procedures.

TA310285

BATTERY HEATER AND INSULATION BOXES: REMOVAL AND INSTALLATION



REMOVAL

A Open all battery access doors.

B Disconnect two hoses (1 and 2).

C Remove wing nut (3) and flat washer (4) and remove top insulation blanket (5).

D Remove screw (6), lockwasher (7) and battery ground cable (8).

E Remove top insulation blanket (9).

F Disconnect and remove batteries (p

G Remove eight screws (10), eight lockwashers (11) and battery heater plate (12).

H Remove lockwire (13), six retaining pins (14) and two winterization boxes (15).

INSTALLATION

Reverse order of removal procedures.

TA310286

HEATER CONTROL BOX: DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

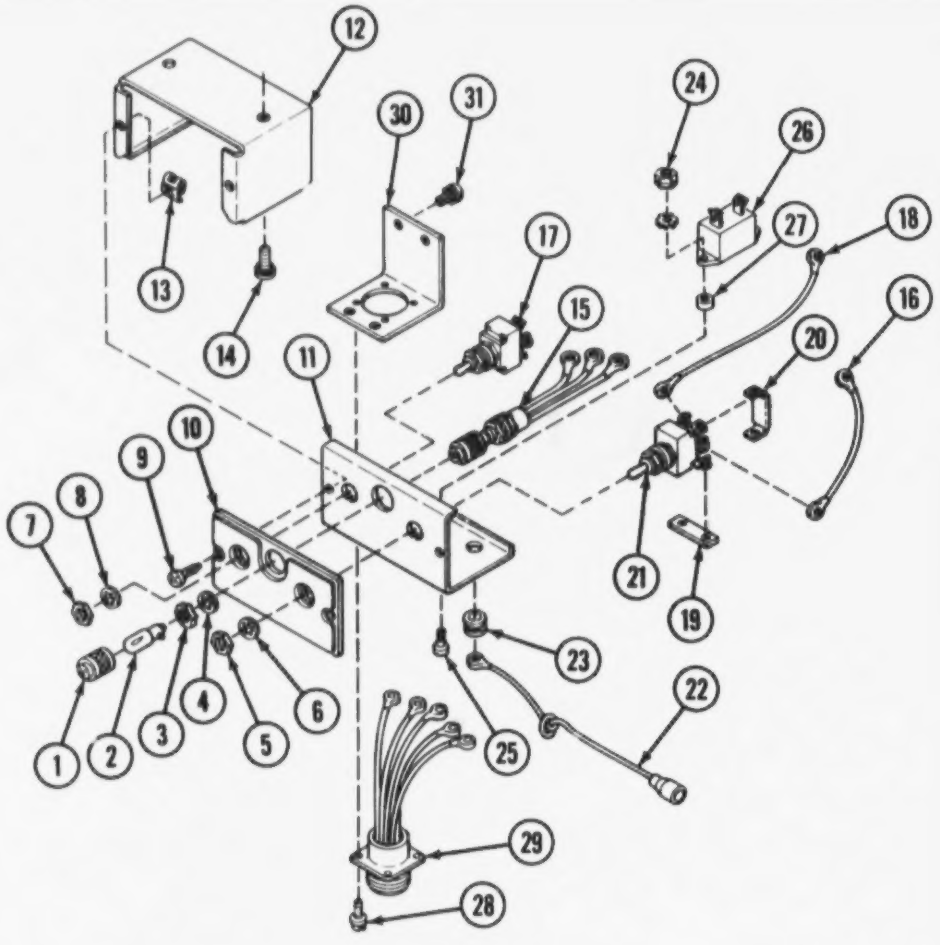
Disassemble items in numerical order.

ASSEMBLY

Assemble items in reverse numerical order.

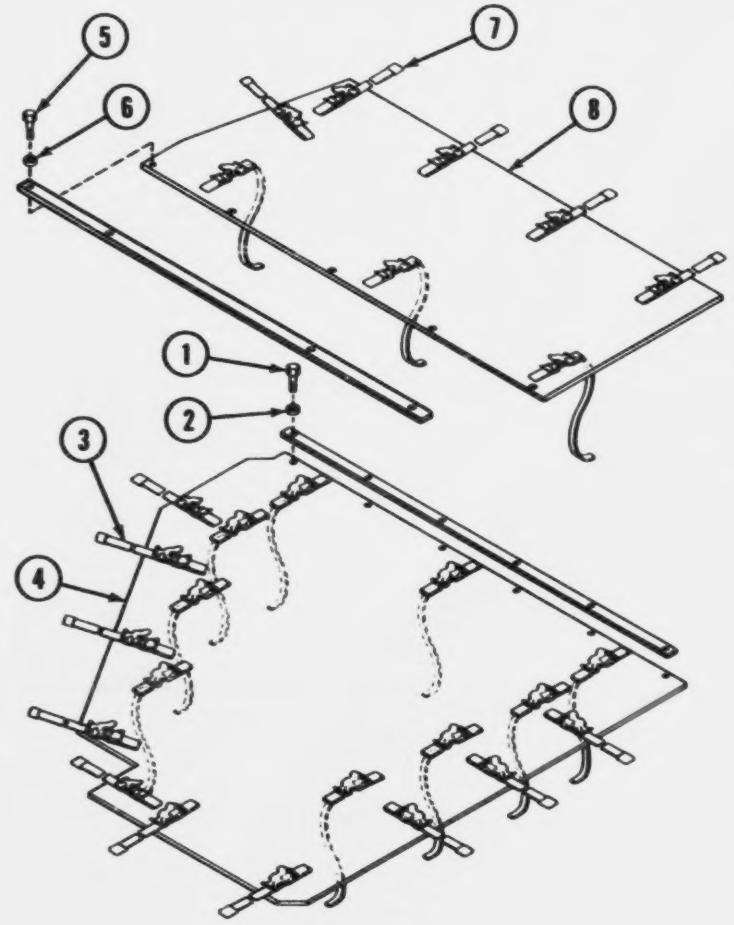
LEGEND

1	Lens assembly
2	Incandescent lamp
3	Nut
4	Washer
5	Nut
6	Washer
7	Nut
8	Washer
9	Screw (2)
10	Switch panel
11	Panel
12	Case assembly
13	Nut (2)
14	Screw (2)
15	Indicator assembly with leads
16	Lead assembly
17	Switch
18	Lead assembly
19	Connector
20	Jumper assembly
21	Switch
22	Lead assembly
23	Grommet
24	Nut (2)
25	Screw (2)
26	Circuit breaker
27	Spacer (2)
28	Screw (4)
29	Receptacle assembly
30	Bracket
31	Screw (2)



TA310287

TARPAULIN GRILLE COVERS: REMOVAL AND INSTALLATION



REMOVAL

A Remove six screws (1) and six washers (2).

B Disconnect 10 strap assemblies (3).

C Remove air intake grille tarpaulin (4).

D Reinstall six screws (1) and six washers (2).

E Remove five screws (5) and five washers (6).

F Disconnect five strap assemblies (7).

G Remove exhaust grille tarpaulin (8).

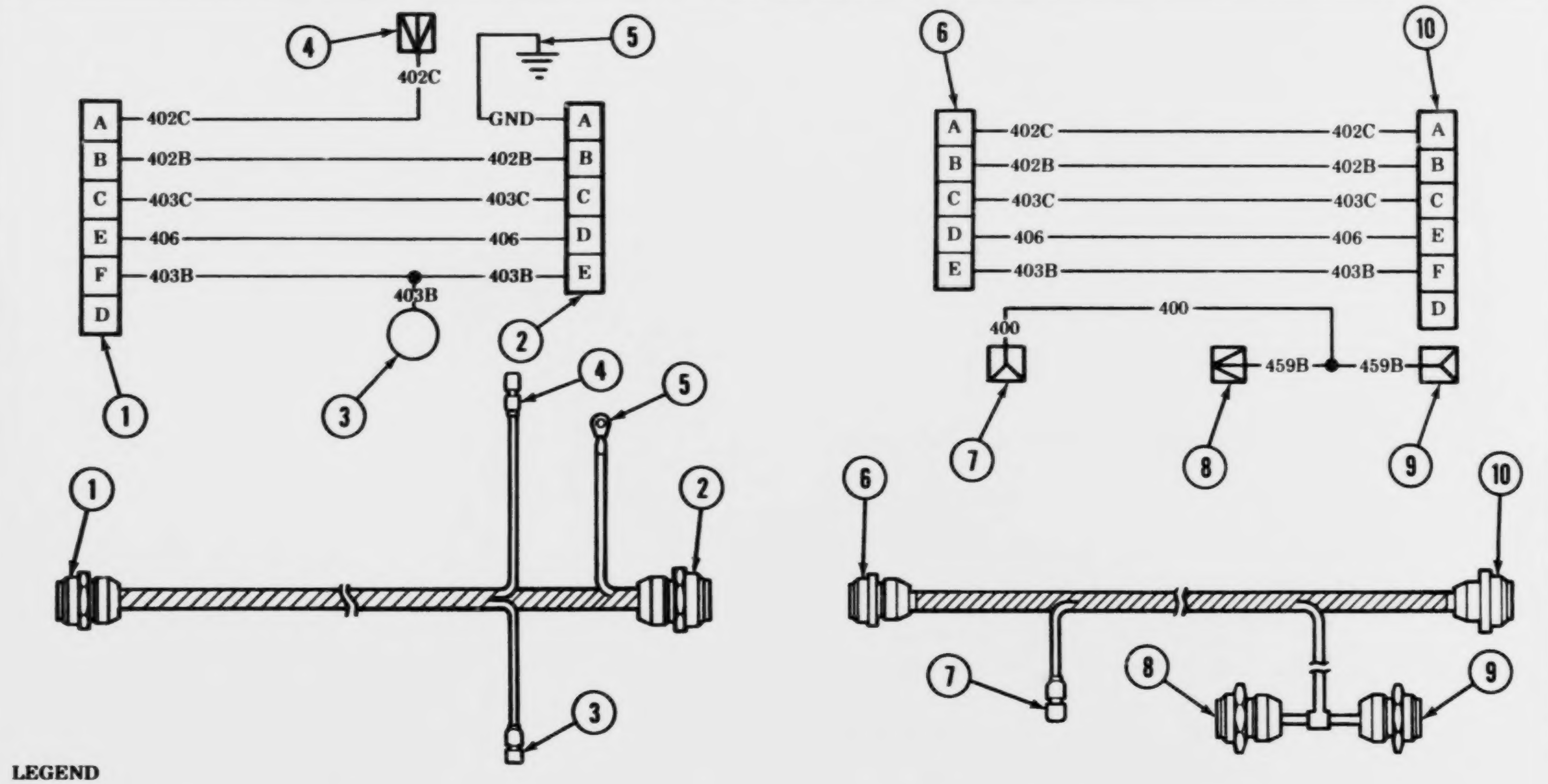
H Reinstall five screws (5) and five washers (6).

INSTALLATION

Reverse order of removal procedures.

TA310288

COOLANT HEATER WIRING HARNESS: REMOVAL AND INSTALLATION



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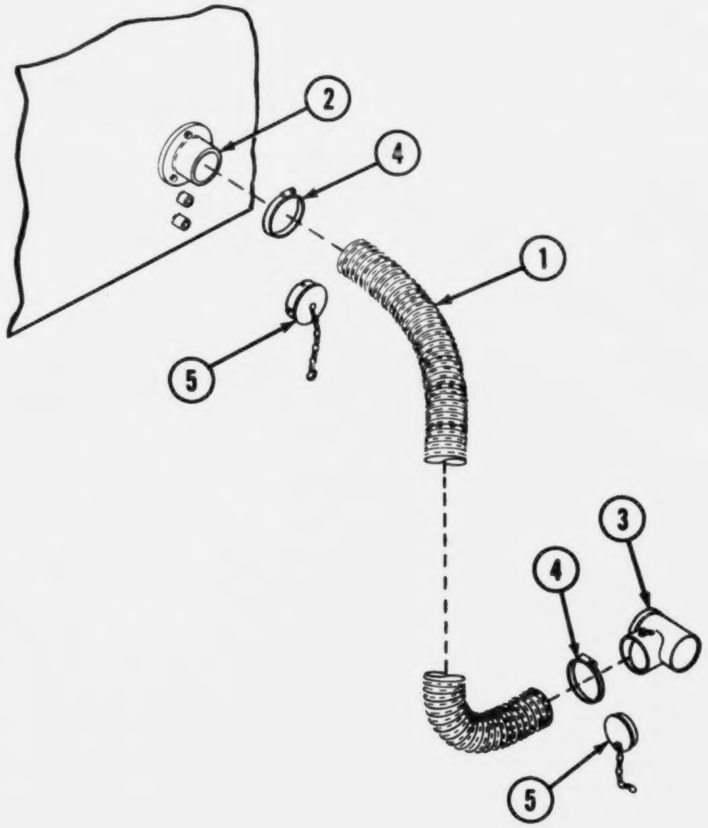
LEGEND

1 Connector, driver's compartment bulkhead
2 Connector, coolant heater
3 Terminal, circulating pump
4 Connector, fuel pump
5 Terminal, ground

6 Connector, heater control box
7 Connector, heater control box (wire 400)
8 Connector, harness 10930473 to MASTER switch
9 Connector, control circuit rectifier
10 Connector, driver's compartment bulkhead

TA310289

APU COMPARTMENT HEATING DUCTS: REMOVAL AND INSTALLATION



REMOVAL

A Release hose (1) from two ducts (2 and 3) by removing two clamps (4) and pulling hose off.

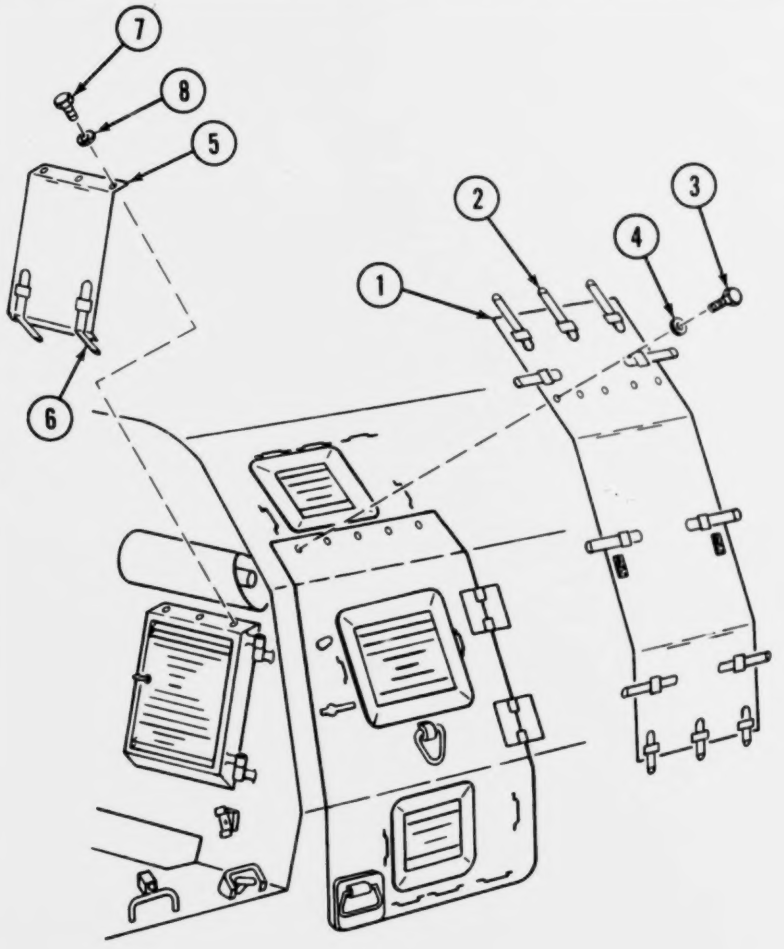
B Reinstall both caps (5) on ducts (2 and 3) and secure caps with clamps (4).

INSTALLATION

Reverse order of removal procedures.

TA310290

APU FRONT DOOR AND SIDE DOOR COVERS: REMOVAL AND INSTALLATION



REMOVAL

A Remove APU side door cover (1) from APU side door by unfastening 12 strap assemblies (2) and removing five screws (3) and five flat washers (4).

B Remove APU front door cover (5) from APU front door by unfastening two strap assemblies (6), and removing three screws (7) and three flat washers (8).

INSTALLATION

Reverse order of removal procedures.

TA310291

CHAPTER 16
MAINTENANCE PROCEDURES: HYDRAULIC SYSTEM

CHAPTER OVERVIEW

This chapter contains illustrated maintenance procedures for the removal, disassembly, assembly and installation of hydraulic system components.

Section I	Hydraulic Reservoir and Filter
Section II	Hydraulic Control Panel Assembly
Section III	Hydraulic Suction and Return Lines, and Associated Parts
Section IV	Backup Hydraulic System
Section V	Hand Pump Assembly and Selector Valve
Section VI	Upper Rear Door Hydraulic Actuator
Section VII	Ammunition Handling Equipment (AHE)
Section VIII	Auxiliary Power Unit (APU) Compartment

Reference Appendix E for hydraulic system description and schematic diagrams.

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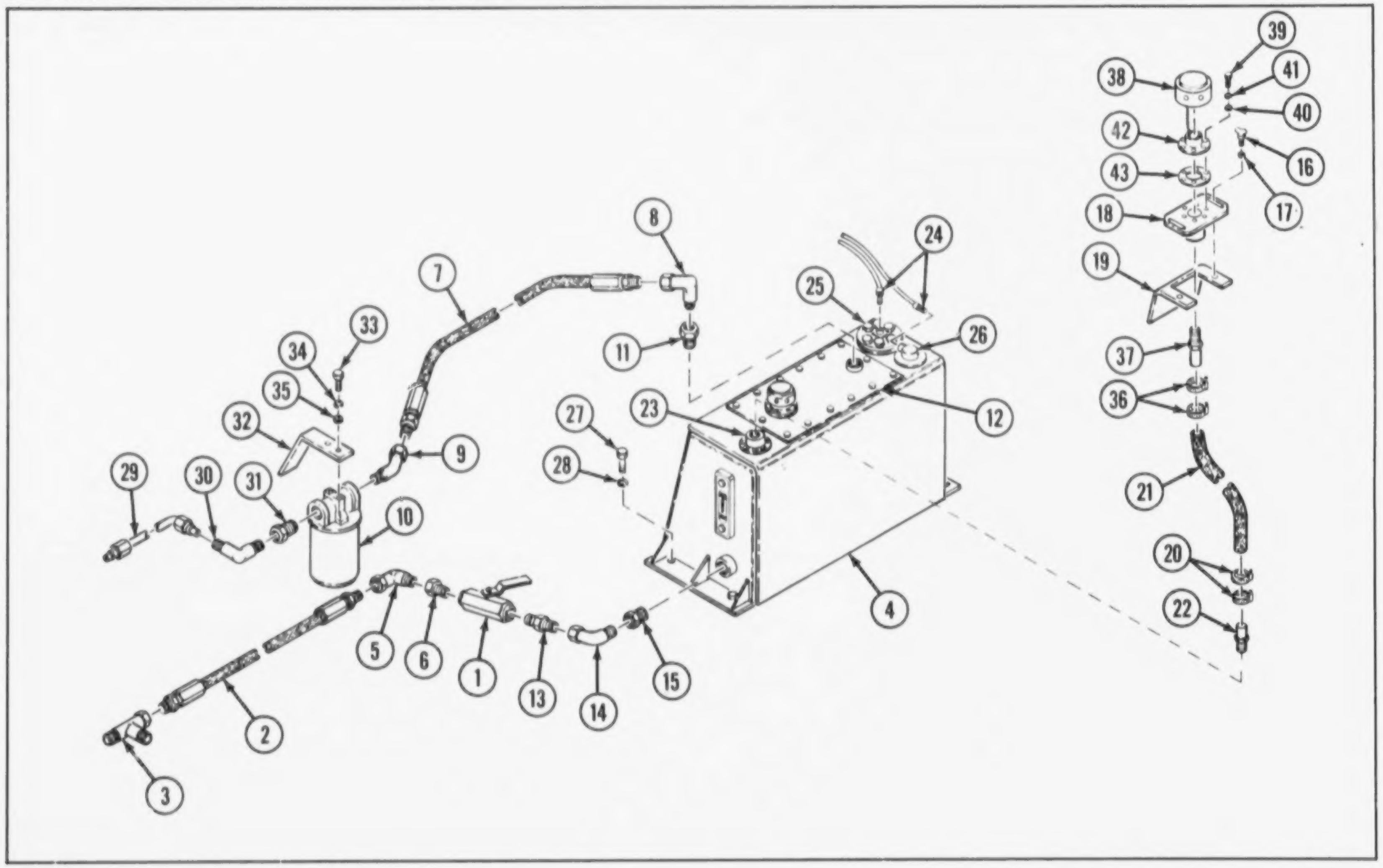
Section I HYDRAULIC RESERVOIR AND FILTER

HYDRAULIC RESERVOIR, FILTER AND FILLER CAP: REMOVAL AND INSTALLATION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TA310751

HYDRAULIC RESERVOIR, FILTER AND FILLER CAP: REMOVAL AND INSTALLATION (CONTINUED)

WARNING

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Take necessary precautions to prevent entry of contaminants into hydraulic system. Hydraulic lines and ports should be capped immediately after disconnecting lines to avoid entry of contaminants into system.

NOTE

Remove right projectile rack to gain access (p 11-5).

REMOVAL

A Close ball valve (1).

B Disconnect hose assembly (2) from tee (3).

C Place a suitable 15-gallon container under hose to catch hydraulic fluid from reservoir (4).

D Open ball valve (1) and allow hydraulic fluid to drain into container.

E Remove hose assembly (2), elbow (5) and reducer (6) from ball valve (1).

F Disconnect hose assembly (7) from elbows (8 and 9). Remove elbow (9) from filter (10).

G Remove elbow (8) and reducer bushing (11) from hydraulic reservoir (4) cover plate (12).

H Remove ball valve (1), nipple (13), elbow (14) and bushing reducer (15) from hydraulic reservoir (4).

I Remove two screws (16), two flat washers (17) and remove plate (18) from bracket (19).

J Remove clamps (20) and pull hose (21) from fitting (22).

K Remove fitting (22) from flange (23).

L Disconnect electrical harness 12330252 connectors (24) from electrical connector on housing assembly (25) and electrical connector to transmitter (26).

M Remove hydraulic reservoir (4) by removing four screws (27) and four lockwashers (28) from hydraulic reservoir mounting plate (not shown).

N Remove tube (29), elbow (30) and reducer bushing (31) from filter (10).

O Remove filter (10) from bracket (32) by removing two screws (33), two lockwashers (34) and two flat washers (35).

P Remove two clamps (36) and pull hose (21) from fitting (37).

Q Pull off cap (38) and remove six screws (39), six flat washers (40), six lockwashers (41) and remove filler flange (42) and gasket (43) from plate (18).

R Remove fitting (37) from plate (18).

INSTALLATION

A Apply pipe sealant (item 57, Appx D) to all male pipe threads.

B Reverse removal procedures.

NOTE

Refer to LO 9-2350-267-12 for hydraulic fluid refill procedures.

TA310752

HYDRAULIC RESERVOIR AND ASSOCIATED COMPONENTS: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Wrench, adjustable, 12 in. (item 66, Appx B)
Wrench, adjustable, 10 in. (item 65, Appx B)
Wrench, pipe, 10 in. (item 72, Appx B)

Materials/Parts:

Pipe sealant (item 57, Appx D)

Equipment Condition:

Hydraulic reservoir removed (p. 16-2).

WARNING

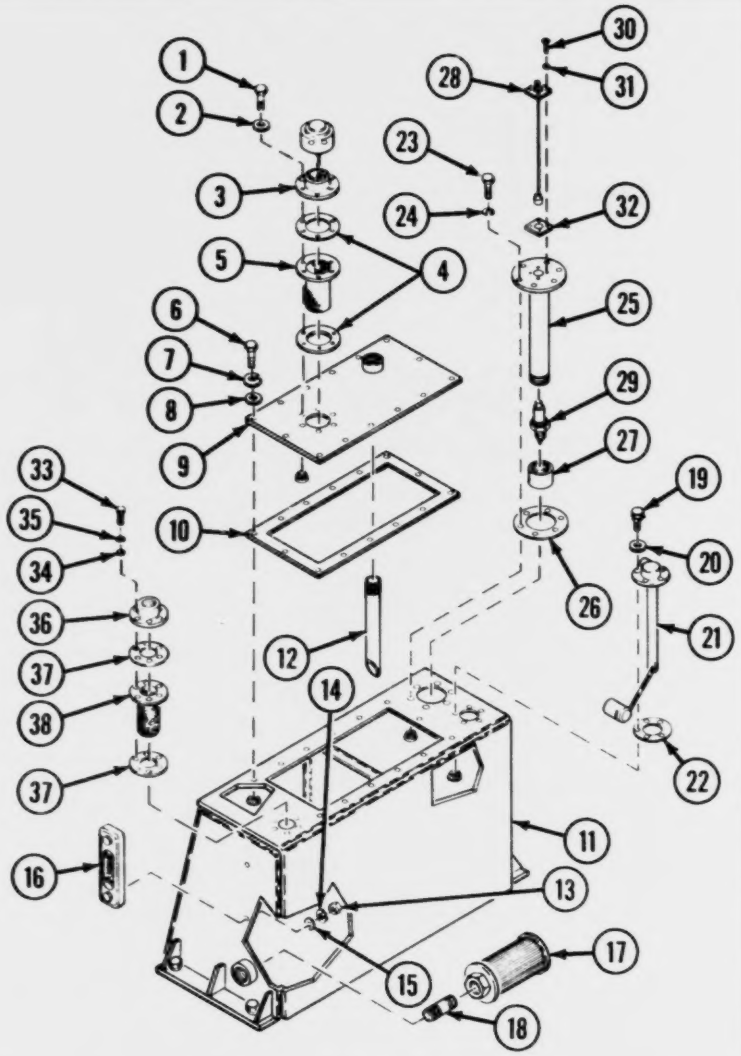
Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Take necessary precautions to prevent entry of contaminants into hydraulic system.

DISASSEMBLY

A Remove six screws (1), six flat washers (2), filler flange (3), two gaskets (4) and strainer (5).



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TA57517

HYDRAULIC RESERVOIR AND ASSOCIATED COMPONENTS: DISASSEMBLY AND ASSEMBLY (CONTINUED)

B Remove 14 screws (6), 14 lockwashers (7) and 14 flat washers (8). Remove cover plate assembly (9) and gasket (10) from top of reservoir (11). Discard lockwashers.

C Remove pipe (12) and cover plate (9).

NOTE

Do step D for vehicles 1-344. For vehicles 345 and above, to to step E.

D Reach through reservoir tank cover plate opening and remove two nuts (13), two lockwashers (14) and two washers (15) from hollow bolts of level gage (16). Remove level gage (16) from reservoir (11). Discard lockwashers.

E Unscrew filter (17) from nipple (18) and remove filter (17) from inside of reservoir (11).

NOTE

Nipple will be damaged during removal. Do not remove unless necessary.

F Remove and discard nipple (18) from inside wall of reservoir (11).

G Remove five screws (19) and five flat washers (20). Carefully remove transmitter (21) and gasket (22) from reservoir (11). Discard gasket.

H Remove six screws (23) and six lockwashers (24). Carefully remove housing assembly (25) and gasket (26) from reservoir (11). Discard lockwashers.

I Unscrew housing cap (27) from housing assembly (25).

J Disconnect electrical lead (28) from transmitter (29).

K Unscrew transmitter (29) and remove housing cap (27).

L Remove four screws (30) and four lockwashers (31). Discard lockwashers.

M Remove lead (28) and gasket (32) from housing (25).

N Remove six screws (33), six flat washers (34), six lockwashers (35), filler flange (36), two gaskets (37) and strainer (38). Discard lockwashers.

ASSEMBLY

NOTE

Apply pipe sealant (item 57, Appx D) to all male pipe threads prior to installation.

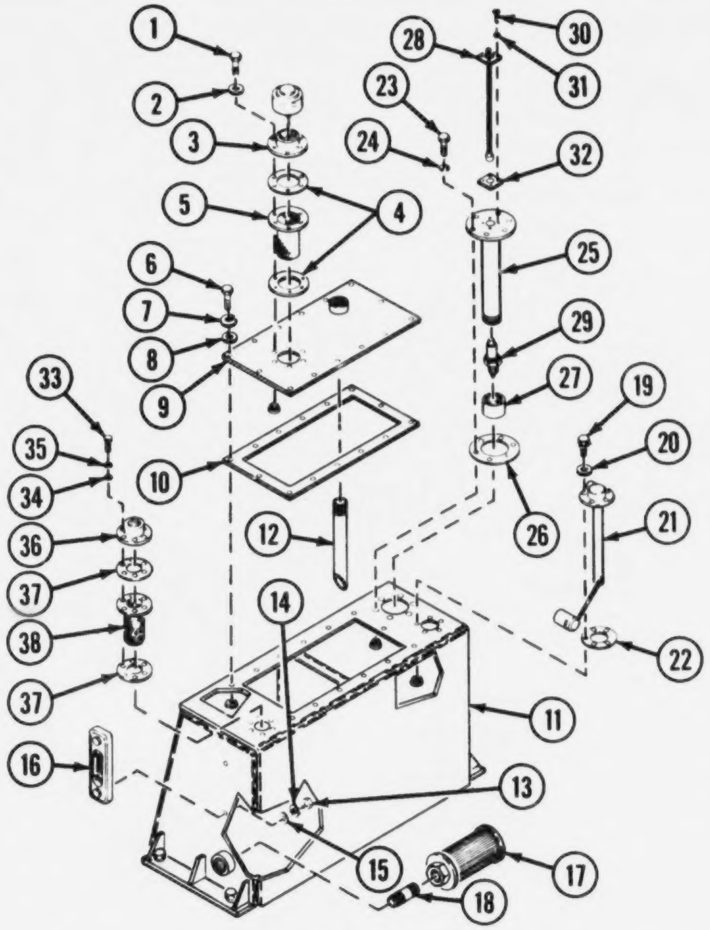
A Install strainer (38), two gaskets (37) and filler flange (36) with six new lockwashers (35), six flat washers (34) and six screws (33).

B Install lead (28) and gasket (32) on housing (25) with four screws (30) and four new lockwashers (31).

C Screw transmitter (29) into housing cap (27).

TA57518

HYDRAULIC RESERVOIR AND ASSOCIATED COMPONENTS: DISASSEMBLY AND ASSEMBLY (CONTINUED)



D Connect electrical lead (28) to transmitter (29).

E Screw housing cap (27) into housing assembly (25).

F Install housing assembly (25) and gasket (26) in reservoir (11) with six screws (23) and six new lockwashers (24).

G Install transmitter (21) and new gasket (22) in reservoir (11) with five screws (19) and five flat washers (20).

H Install new nipple (18) on inside wall of reservoir (11).

I Screw filter (17) onto nipple (18).

NOTE

Do step J for vehicles 1-344. For vehicles 345 and above, go to step K.

J Install level gage (16) on reservoir (11) with two washers (15), two new lockwashers (14), and two nuts (13).

K Install pipe (12) on cover plate (9).

CAUTION

Make sure inside of reservoir is clean and free of foreign material prior to cover plate installation.

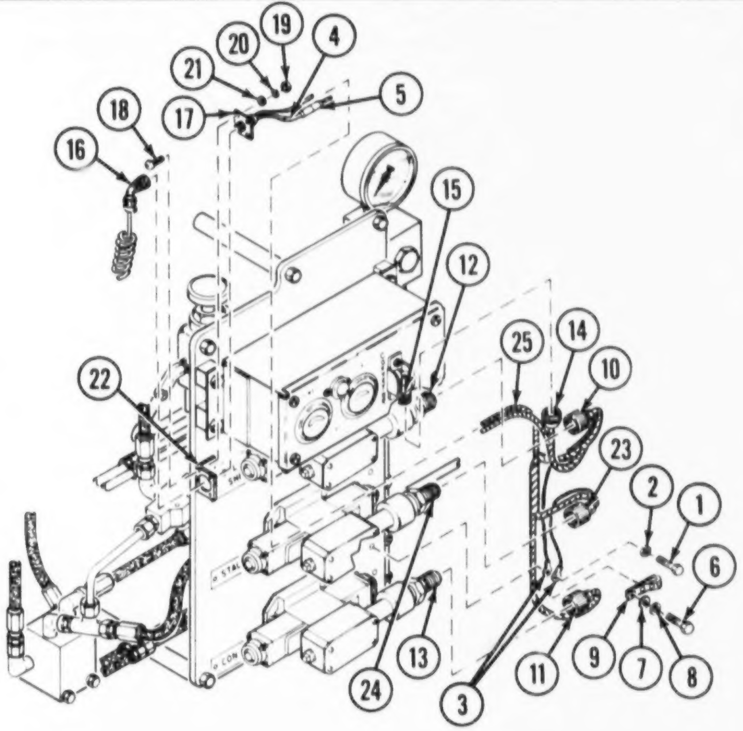
L Install cover plate assembly (9) and gasket (10) on top of reservoir (11) with 14 screws (6), 14 new lockwashers (7) and 14 flat washers (8).

M Install strainer (5), two gaskets (4) and filler flange (3) with six screws (1) and six flat washers (2).

TA57519

Section II HYDRAULIC CONTROL PANEL ASSEMBLY

HYDRAULIC CONTROL PANEL ASSEMBLY: REMOVAL AND INSTALLATION



WARNING

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Take necessary precautions to prevent entry of contaminants into hydraulic system. Hydraulic lines and ports should be capped immediately after disconnecting lines to avoid entry of contaminants into system.

NOTE

Tag all electrical leads, and hydraulic tubes and hoses for identification at installation.

REMOVAL

A Remove screw (1) and lockwasher (2), and disconnect two ground wires (3).

B Disconnect stacker power lead wire No. 10 (4) from harness (12330252) lead 10 connector (5).

C Remove three straps (9) by removing screw (6), flat washer (7) and lockwasher (8).

D Remove two electrical connectors (10 and 11) from ballistic shield solenoid valve (12) and conveyor solenoid valve (13).

E Disconnect electrical connector (14) from hydraulic gage panel (15).

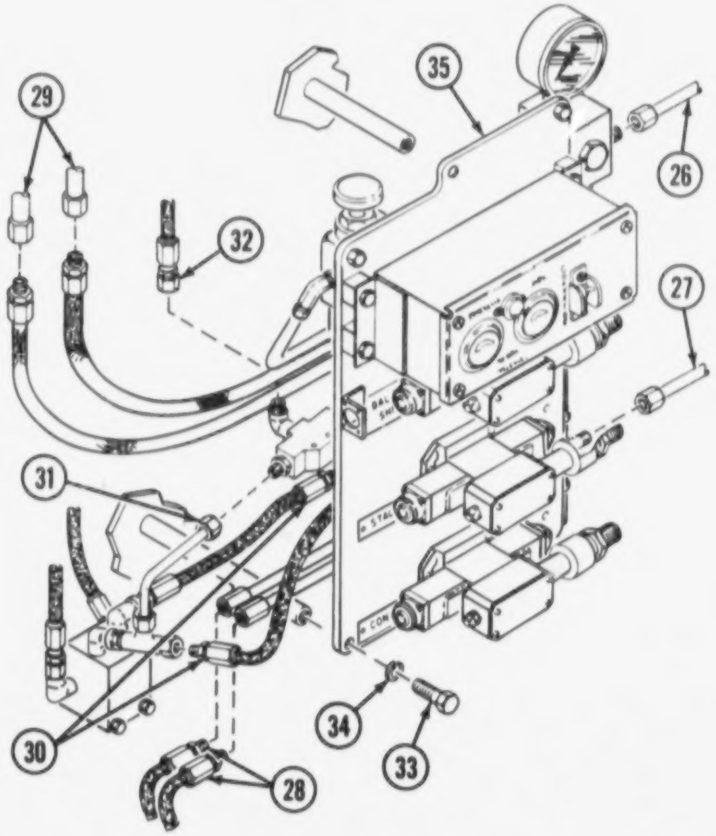
F Disconnect stacker control switch cable (16) from harness receptacle (17).

G Remove four screws (18), four nuts (19), four lockwashers (20) and four flat washers (21), and remove receptacle (17) from bracket (22).

H Disconnect stacker solenoid valve connector (23) from stacker solenoid valve (24) and remove harness (25).

TA310755

HYDRAULIC CONTROL PANEL ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



I Disconnect hydraulic fluid inlet line (26).

J Disconnect hydraulic reservoir return line (27).

K Disconnect two conveyor hydraulic lines (28).

L Disconnect two ballistic shield hydraulic lines (29).

M Disconnect two stacker hydraulic lines (30) and shuttle valve hydraulic lines (31 and 32).

NOTE

Loosen opposite end of hydraulic tube (31) and turn tube toward wall so panel will clear at removal.

N Remove three screws (33) and three lockwashers (34), and carefully remove hydraulic control panel assembly (35).

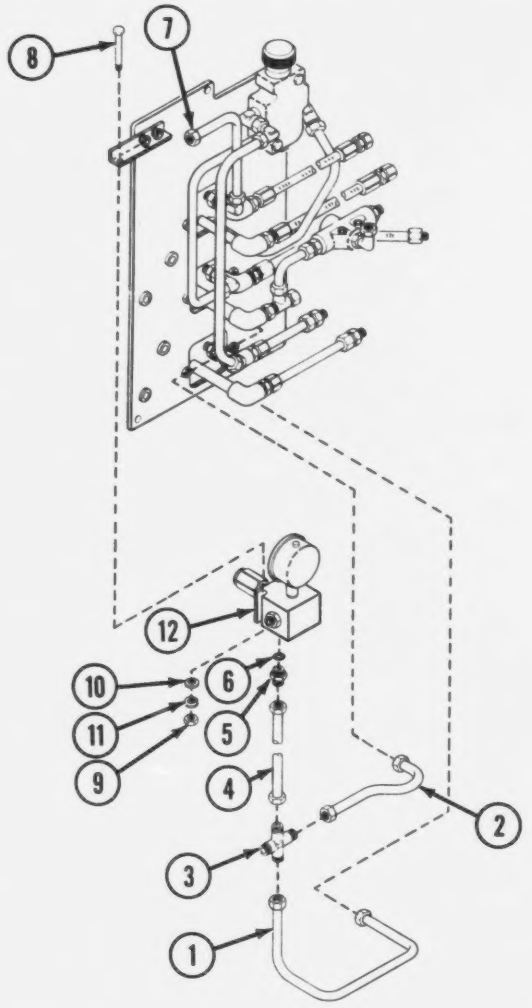
INSTALLATION

A Apply pipe sealant (item 57, Appx D) to all male pipe threads at installation.

B Reverse removal procedures.

TA310756

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY



WARNING

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Take necessary precautions to prevent entry of contaminants into hydraulic system. Hydraulic lines and ports should be capped immediately after disconnecting lines to avoid entry of contaminants into system.

NOTE

Tag all hydraulic components for identification at installation.

DISASSEMBLY

A Remove hydraulic control panel assembly (p 16-6).

B Remove tube assembly (1).

C Remove tube assembly (2).

D Remove union cross (3).

E Remove tube assembly (4).

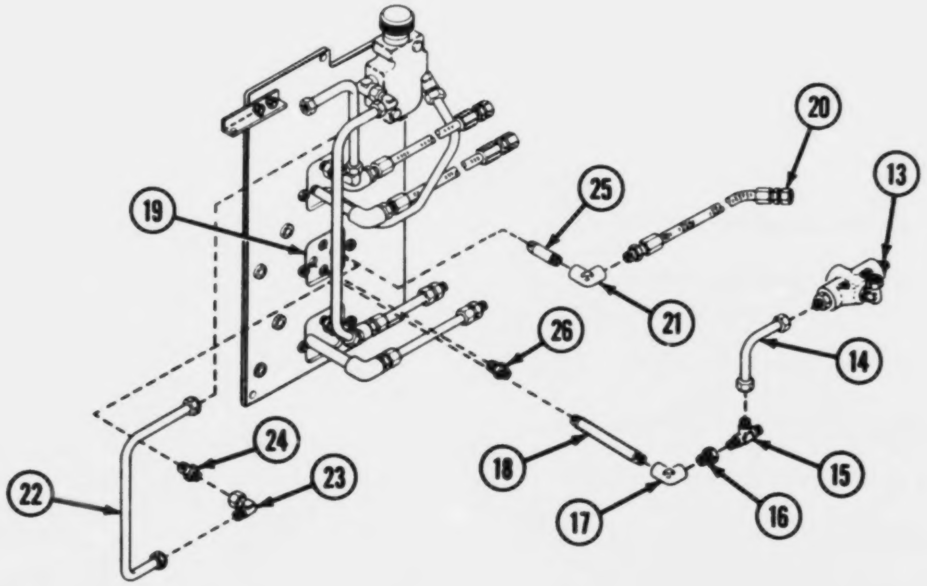
F Remove adapter (5) and packing (6). Discard packing (6).

G Loosen connectors of tube assembly (7).

H Remove two screws (8), two nuts (9), two flat washers (10) and two lockwashers (11), and remove pressure gage assembly (12) from panel.

TA310757

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



I Remove shuttle valve (13) from tube assembly (14).

J Remove tube assembly (14) from tee (15).

K Remove tee (15) from reducer bushing (16).

L Remove reducer bushing (16) from elbow (17).

M Remove elbow (17) from nipple (18).

N Remove nipple (18) from hydraulic subplate (19).

O Remove hose (20) from elbow (21).

P Remove tube assembly (22).

Q Remove elbow (23) from adapter (24).

R Remove adapter (24) from hydraulic subplate assembly (19).

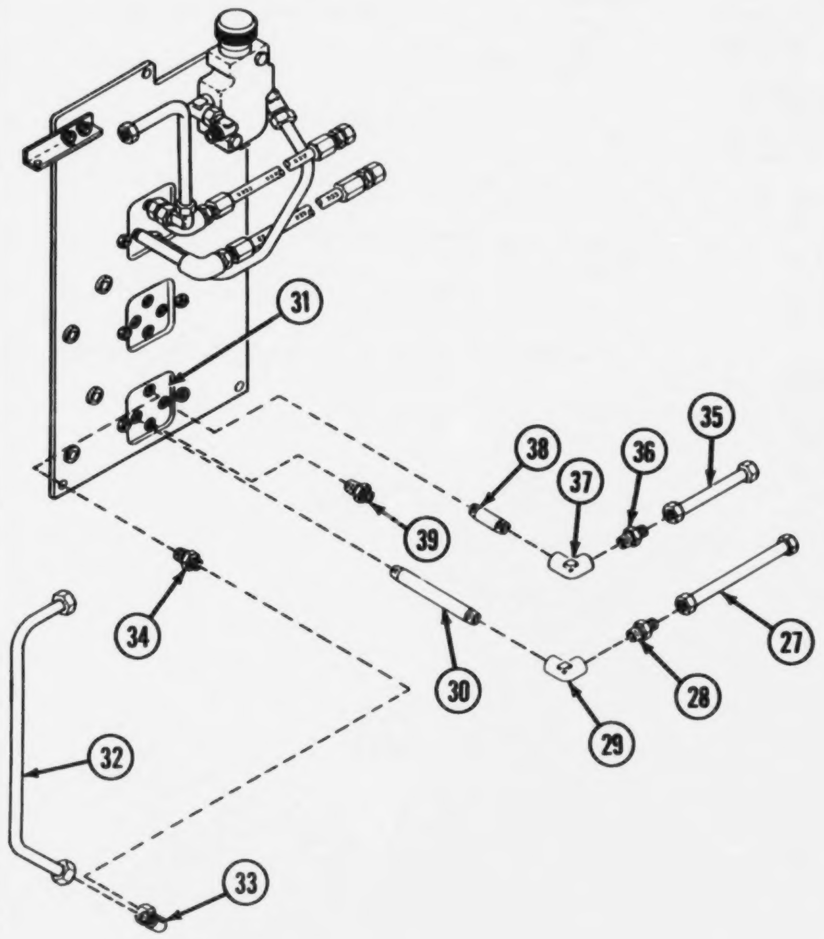
S Remove elbow (21) from nipple (25).

T Remove adapter (26) from subplate assembly (19).

U Remove nipple (25) from subplate assembly (19).

TA310758

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



V Remove tube assembly (27).

W Remove reducer bushing (28) from elbow (29).

X Remove elbow (29) from nipple (30).

Y Remove nipple (30) from hydraulic subplate (31).

Z Remove tube assembly (32).

AA Remove elbow (33) from reducer bushing (34).

AB Remove reducer bushing (34) from hydraulic subplate (31).

AC Remove tube assembly (35) from reducer bushing (36).

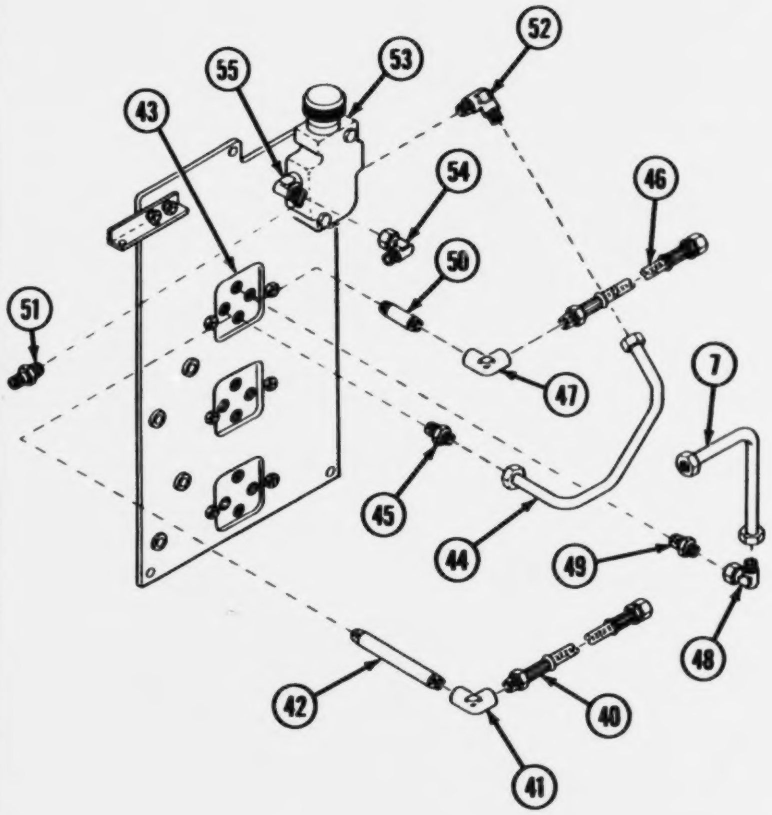
AD Remove reducer bushing (36) from elbow (37).

AE Remove elbow (37) from nipple (38), and remove reducer bushing (39) from hydraulic subplate (31).

AF Remove nipple (38) from hydraulic subplate (31).

TA310759

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



AG Remove hose (40) from elbow (41).

AH Remove elbow (41) from nipple (42).

AI Remove nipple (42) from hydraulic subplate (43).

AJ Remove tube assembly (44).

AK Remove reducer bushing (45) from subplate (43).

AL Remove hose (46) from elbow (47).

AM Remove tube (7) from elbow (48).

AN Remove elbow (48) from reducer bushing (49).

AO Remove reducer bushing (49) from hydraulic subplate (43).

AP Remove elbow (47) from nipple (50).

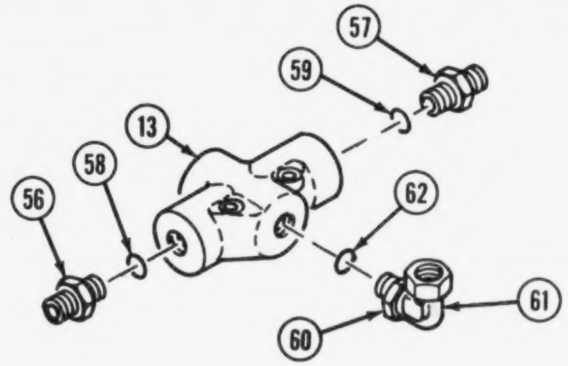
AQ Remove nipple (50) from hydraulic subplate (43).

AR Remove adapter (51) and elbow (52) from flow control valve (53).

AS Remove elbow (54) from elbow (55).

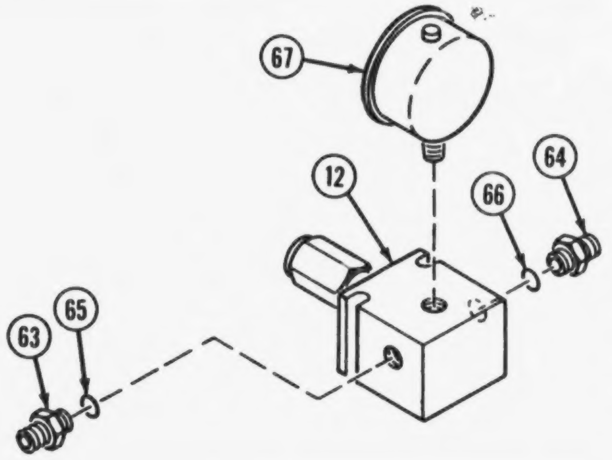
TA313144

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



AT Remove two fittings (56 and 57) and two packings (58 and 59) from shuttle valve (13). Discard packings.

AU Loosen jamnut (60) and remove elbow (61) and packing (62) from shuttle valve (13). Discard packing.

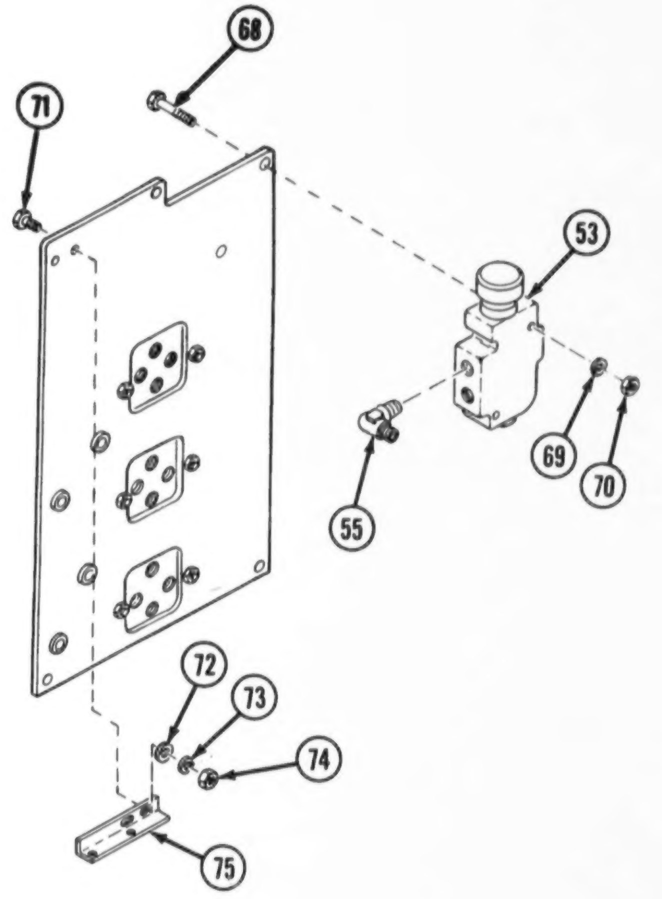


AV Remove two adapters (63 and 64) from gage assembly (12), and remove two packings (65 and 66). Discard packings.

AW Remove gage (67) from gage assembly (12).

TA313145

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)

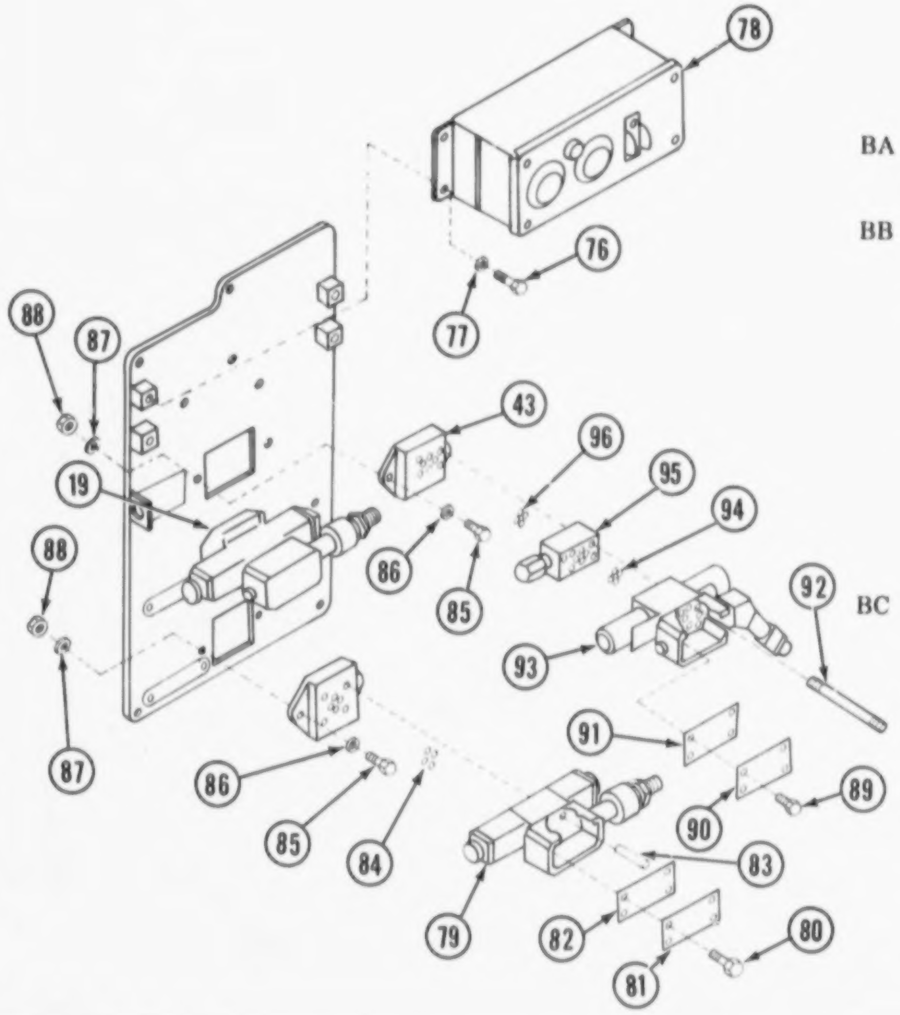


AX Remove two screws (68), two lockwashers (69) and two nuts (70), and remove flow control valve (53). Discard lockwashers.

AY Remove two screws (71), two flat washers (72), two lockwashers (73) and two nuts (74), and remove gage assembly bracket (75). Discard lockwashers.

AZ Remove elbow (55) from flow control valve (53).

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



BA Remove four screws (76), four lockwashers (77) and gage panel assembly (78). Discard lockwashers.

BB Conveyor and stacker directional control valve removal (79).

1 Remove four screws (80), plate (81) and gasket (82). Remove four screws (83), and remove directional control valve (79) from subplate assemblies (19 and 31). Remove and discard packings (84).

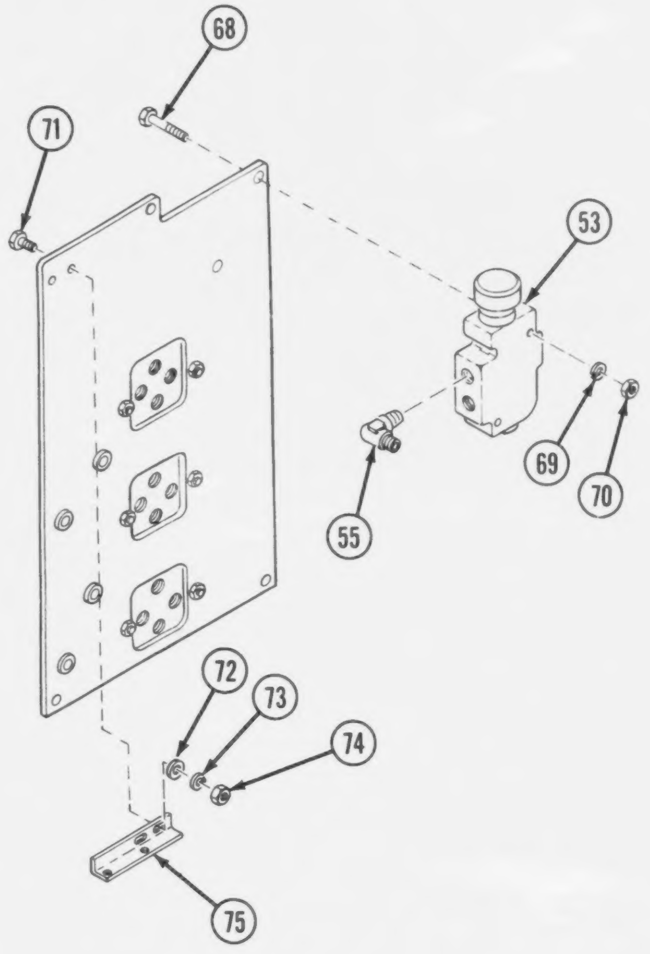
2 Remove each subplate assembly (19 and 31) by removing two screws (85), two flat washers (86), two lockwashers (87) and two nuts (88). Discard lockwashers.

BC Ballistic shield directional control valve removal (93).

1 Remove four screws (89), plate (90) and gasket (91). Remove four screws (92) and remove directional control valve (93) from subplate relief valve assembly (95) and subplate assembly (43). Remove and discard packings (94 and 96).

2 Remove subplate assembly (43) by removing two screws (85), two flat washers (86), two lockwashers (87) and two nuts (88). Discard lockwashers.

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



ASSEMBLY

A Ballistic shield directional control valve installation (93).

1 Install subplate assembly (43) with two screws (85), two flat washers (86), two new lockwashers (87) and two nuts (88).

2 Install directional control valve (93) and subplate relief valve assembly (95) onto subplate assembly (43) with four screws (92) and new packings (94 and 96). Install four screws (89), plate (90) and gasket (91).

B Conveyor and stacker directional control valve installation (79).

1 Install each subplate assembly (19 and 43) with two screws (85), two flat washers (86), two new lockwashers (87) and two nuts (88).

2 Install directional control valve (79) onto each subplate assembly (19 and 43) with four screws (83) and new packings (84). Install four screws (81), plate (82) and gasket (82).

C Install gage panel assembly (78) with four screws (76) and four new lockwashers (77).

NOTE

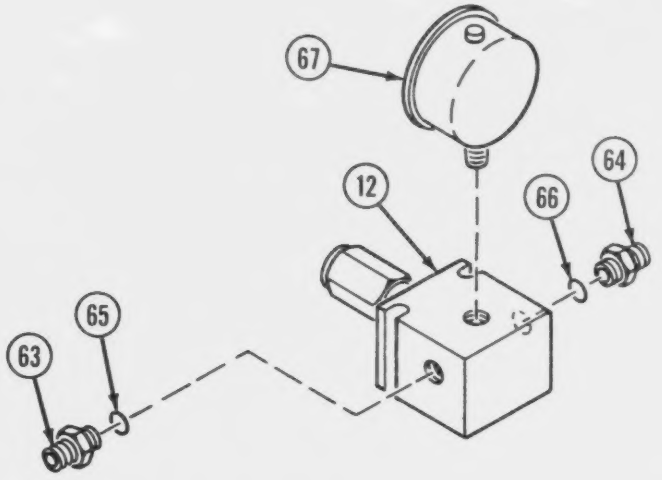
Apply pipe sealant (item 57, Appx D) to all male pipe threads prior to assembly.

D Install elbow (55) on flow control valve (53).

E Install gage assembly bracket (75) with two screws (71), two flat washers (72), two new lockwashers (73) and two nuts (74).

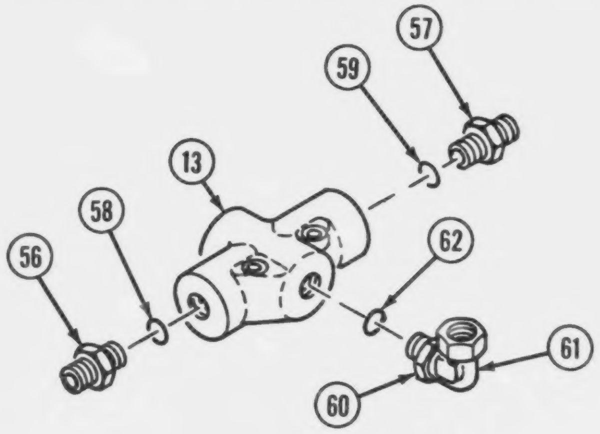
F Install flow control valve (53) with two screws (68), two new lockwashers (69) and two nuts (70).

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



G Install gage (67) on gage assembly (12).

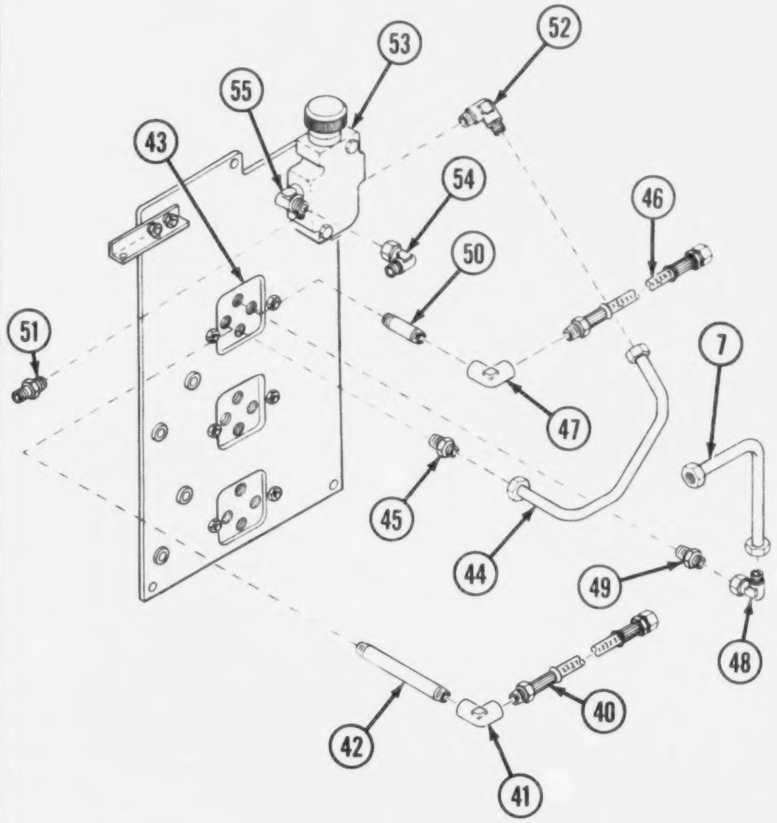
H Install two new packings (65 and 66) and two adapters (63 and 64) on gage assembly (12).



I Install new packing (62) and elbow (61) on shuttle valve (13) and tighten jamnut (60).

J Install two new packings (58 and 59) and two fittings (56 and 57) on shuttle valve (13).

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



K Install elbow (54) on elbow (55).

L Install elbow (52) and adapter (51) on flow control valve (53).

M Install nipple (50) on hydraulic subplate (43).

N Install elbow (47) on nipple (50).

O Install reducer bushing (49) on hydraulic subplate (43).

P Install elbow (48) on reducer bushing (49).

Q Install tube (7) on elbow (48).

R Install hose (46) on elbow (47).

S Install reducer bushing (45) on subplate (43).

T Install tube assembly (44).

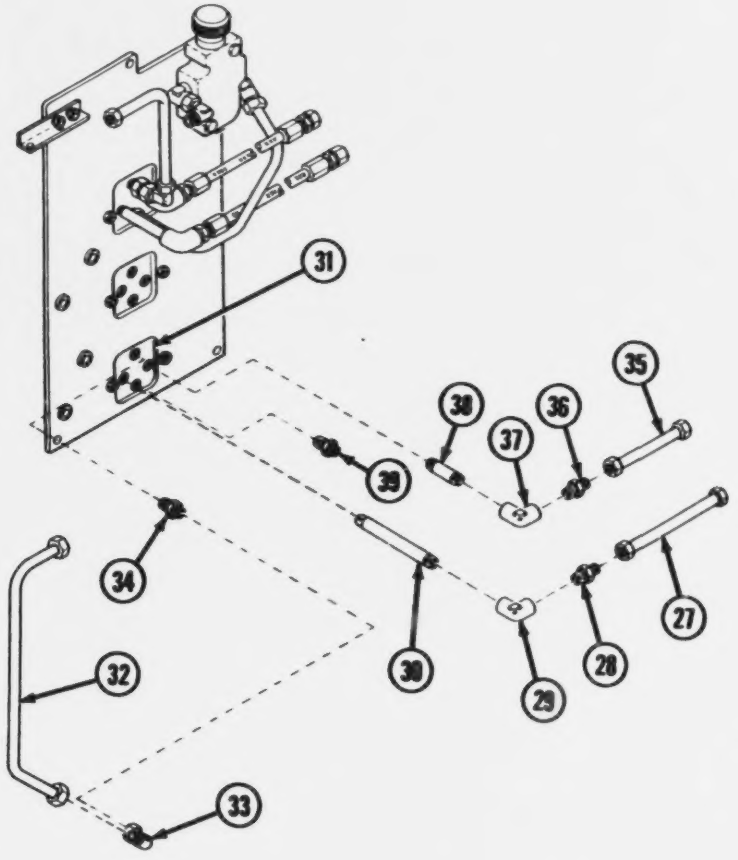
U Install nipple (42) on hydraulic subplate (43).

V Install elbow (41) on nipple (42).

W Install hose (40) on elbow (41).

TA313150

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



X Install nipple (38) on hydraulic subplate (31).

Y Install reducer bushing (39) on hydraulic subplate (31) and elbow (37) on nipple (38).

Z Install reducer bushing (36) on elbow (37).

AA Install tube assembly (35) on reducer bushing (36).

AB Install reducer bushing (34) on hydraulic subplate (31).

AC Install elbow (33) on reducer bushing (34).

AD Install tube assembly (32).

AE Install nipple (30) on hydraulic subplate (31).

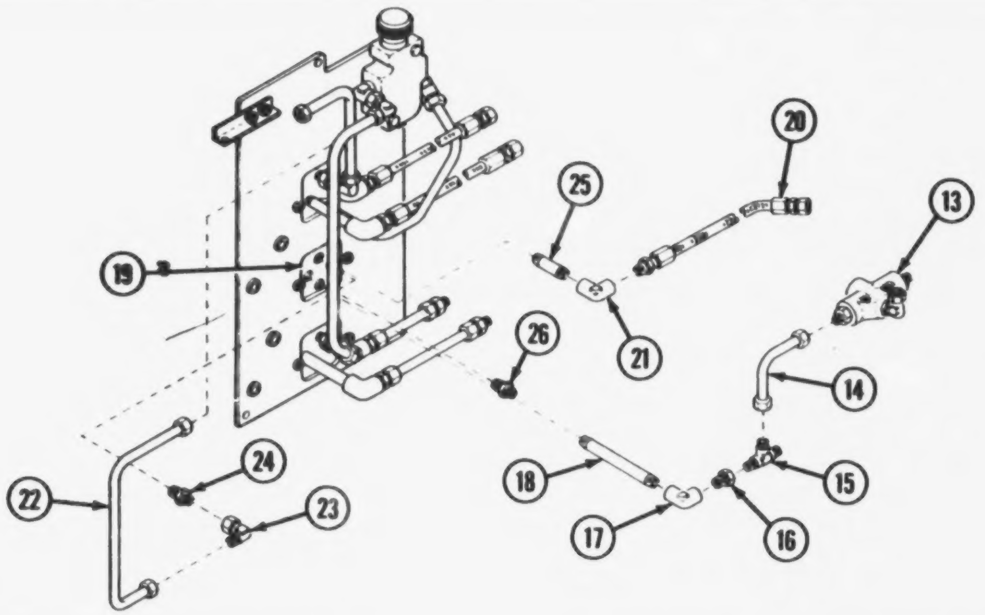
AF Install elbow (29) on nipple (30).

AG Install reducer bushing (28) on elbow (29).

AH Install tube assembly (27).

TA313151

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



AI Install nipple (25) on hydraulic subplate assembly (19).

AJ Install adapter (26) on hydraulic subplate assembly (19).

AK Install elbow (21) on nipple (25).

AL Install adapter (24) on hydraulic subplate assembly (19).

AM Install elbow (23) on adapter (24).

AN Install tube assembly (22).

AO Install hose (20) on elbow (21).

AP Install nipple (18) on hydraulic subplate (19).

AQ Install elbow (17) on nipple (18).

AR Install reducer bushing (16) on elbow (17).

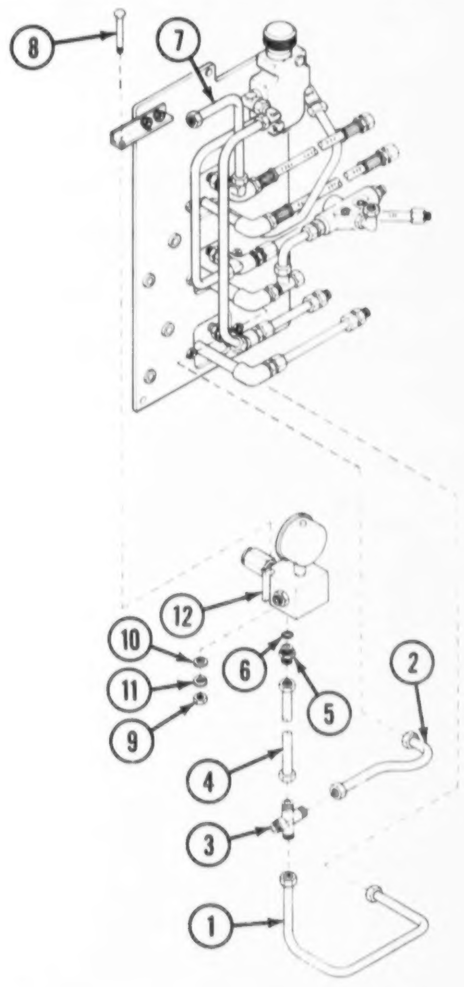
AS Install tee (15) on reducer bushing (16).

AT Install tube assembly (14) on tee (15).

AU Install shuttle valve (13) on tube assembly (14).

TA313152

HYDRAULIC CONTROL PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



AV Install pressure gage (12) on panel with two screws (8), two flat washers (10), two new lockwashers (11) and two nuts (9).

AW Connect tube assembly (7).

AX Install new packing (6) and adapter (5).

AY Install tube assembly (4).

AZ Install union cross (3).

BA Install tube assembly (2).

BB Install tube assembly (1).

BC Install hydraulic control panel assembly (p 16-6).

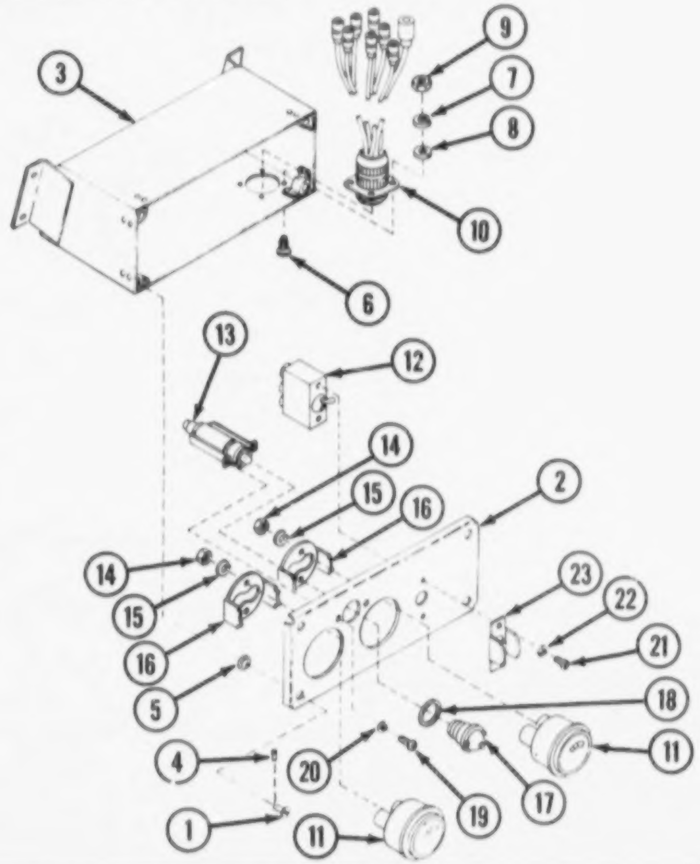
TA313153

HYDRAULIC CONTROL GAGE PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Equipment Conditions:

Hydraulic control gage panel removed (p 16-14).



DISASSEMBLY

WARNING

When working on vehicle's electrical system, turn vehicle MASTER power switch OFF. Remove dog tags, rings and other jewelry. Disconnect batteries by removing ground cables first. Connect ground cables last when connecting batteries.

A Turn four 1/4-turn captive screws (1) securing cover (2) to control box body (3).

B Remove pin (4) and push-on nut (5) from screw (1) as necessary.

C Remove four screws (6), four lockwashers (7), four flat washers (8) and four nuts (9) and remove connector J1 (10).

NOTE

Tag electrical leads upon removal to ensure proper installation.

D Disconnect electrical leads from rear of two indicators (11), toggle switch (12) and indicator light (13).

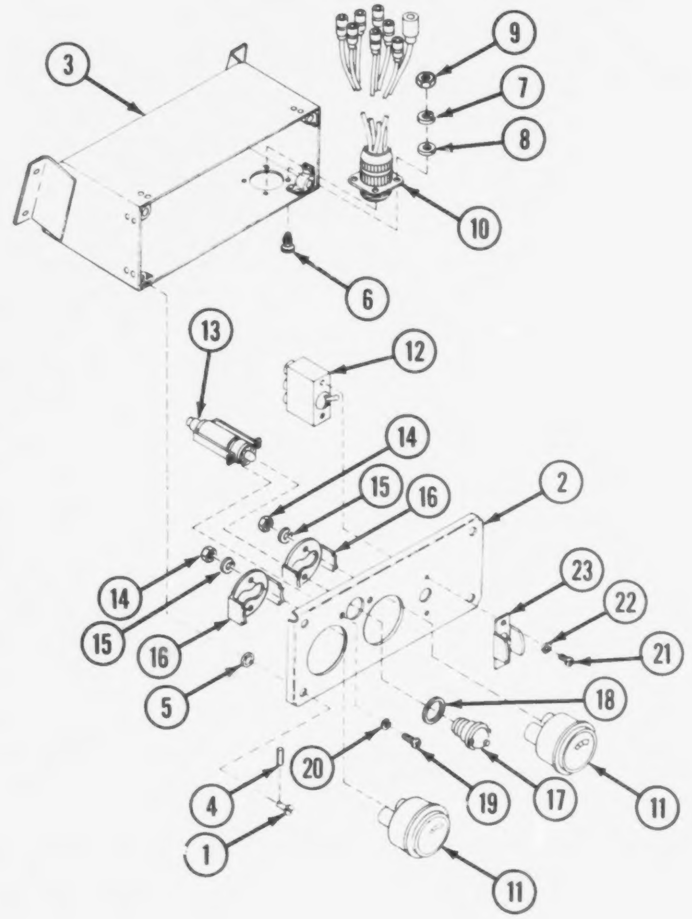
E Remove two nuts (14), two lockwashers (15) and two mounting clamps (16) securing indicators (11) to cover (2). Discard lockwashers.

F Remove lens (17) and gasket (18) from indicator light (13). Discard gasket.

G Remove two screws (19) and two lockwashers (20) securing indicator light (13) to cover (2). Discard lockwashers.

TA313154

HYDRAULIC CONTROL GAGE PANEL ASSEMBLY: DISASSEMBLY AND ASSEMBLY (CONTINUED)



H Remove two screws (21) and two lockwashers (22) securing toggle switch (12) and guard (23) to cover (2). Discard lockwashers.

ASSEMBLY

A Install toggle switch (12) and guard (23) on cover (2) with two new lockwashers (22) and two screws (21).

B Install indicator light (13) on cover (2) with two new lockwashers (20) and two screws (19).

C Install new gasket (18) and lens (17) on indicator light (13).

D Install two indicators (11) on cover (2) with two mounting clamps (16), two new lockwashers (15) and two nuts (14).

E Connect electrical leads to indicators (11), toggle switch (12) and indicator light (13).

F Install connector J1 (10) on control box body (3) with four screws (6), four new lockwashers (7), four flat washers (8) and four nuts (9).

G Install four 1/4-turn captive screws (1) through cover (2) with pin (4) and push-on nut (5) as necessary.

H Secure cover (2) by turning four 1/4-turn captive screws (1).

TA313155

Section III HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION

INITIAL SETUP

Parts/materials:

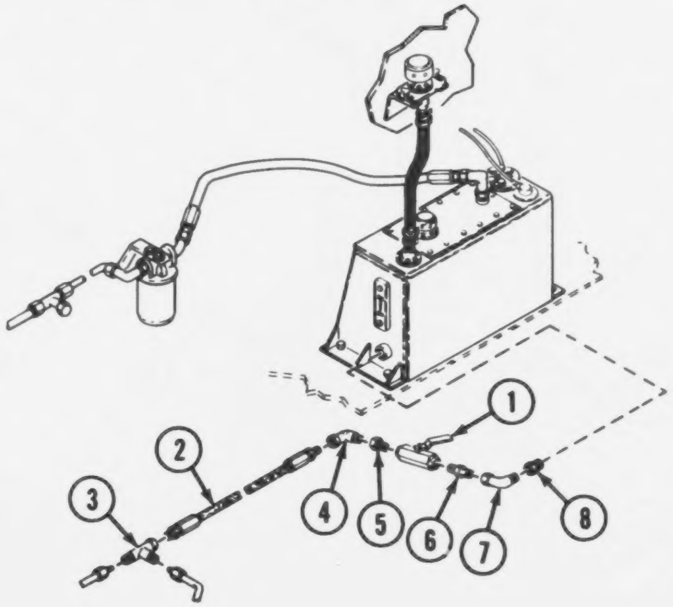
Pipe sealant (item 57, Appx D).

References:

LO 9-2350-267-12

Equipment Condition:

Left and right projectile racks removed (p 11-5).
Ventilation blower duct removed (p 14-61).



General Safety Instructions:

Make sure hydraulic systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

Hydraulic lines and ports should be capped immediately after disconnecting lines to avoid entry of contaminants into hydraulic system.

NOTE

Tag hydraulic components for proper installation.

REMOVAL

A Close ball valve (1).

B Disconnect hose assembly (2) from tee (3) and elbow (4).

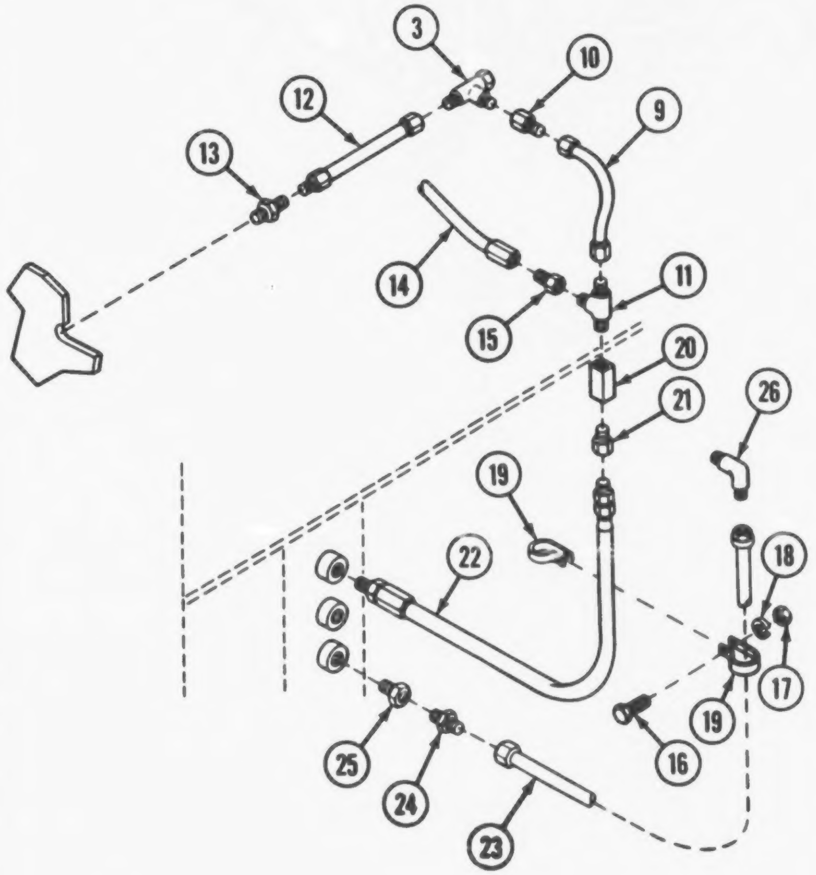
NOTE

Before doing step C, drain hydraulic reservoir (p 16-2 and 16-3, steps A through D). If disassembly is not necessary, go to step D.

C Remove elbow (4), reducer (5), ball valve (1), nipple (6), elbow (7) and bushing (8).

TA57520

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



D Remove tube assembly (9) and adapter (10) from tees (11 and 3).

E Remove adapter (10) from tube assembly (9).

F Remove tee (3), tube assembly (12) and adapter (13).

G Disconnect line (14) and remove adapter (15) from tee (11).

H Remove screw (16), nut (17) and lockwasher (18), and remove two clamps (19). Discard lockwasher.

I Remove tee (11) from check valve (20).

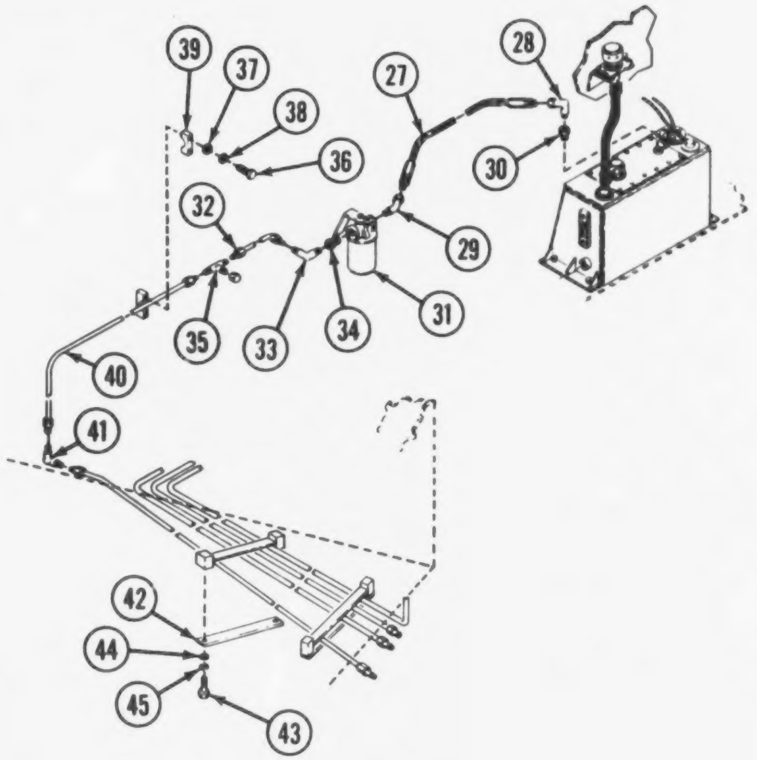
J Remove check valve (20), adapter (21) and hose (22).

K Disconnect and remove tube assembly (23) from adapter (24), and remove adapter (24) and bushing (25) from bulkhead.

L Remove tube (23) from elbow (26).

TA57521

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



M Remove hose assembly (27) from elbows (28 and 29).

N Remove elbow (28) and bushing (30).

O Remove elbow (29) from filter unit (31).

P Remove tube assembly (32).

Q Remove elbow (33) and bushing (34) and remove tee (35) from tube assembly (32).

R Remove two screws (36), two flat washers (37), two lockwashers (38) and clamp (39). Discard lockwashers.

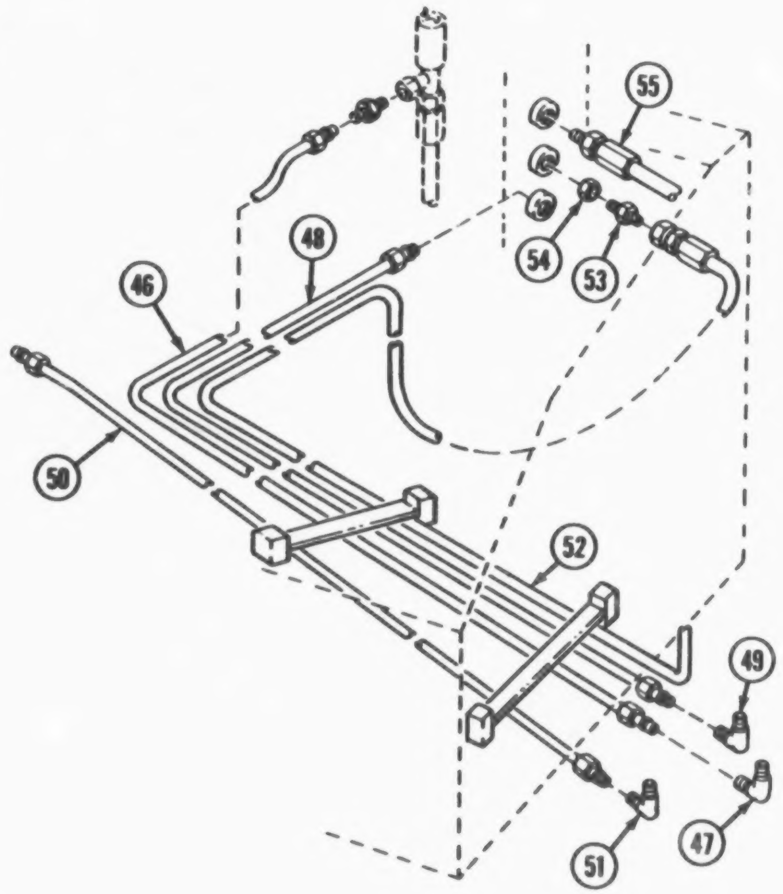
S Remove tube assembly (40) at elbow (41).

T Remove elbow (41).

U Remove two brackets (42) from underneath APU compartment by removing from each two screws (43), two flat washers (44) and two lockwashers (45). Discard lockwashers.

TA57522

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



V Remove tube assembly (46) and elbow (47).

W Remove tube assembly (48) and elbow (49).

X Remove tube assembly (50) and elbow (51).

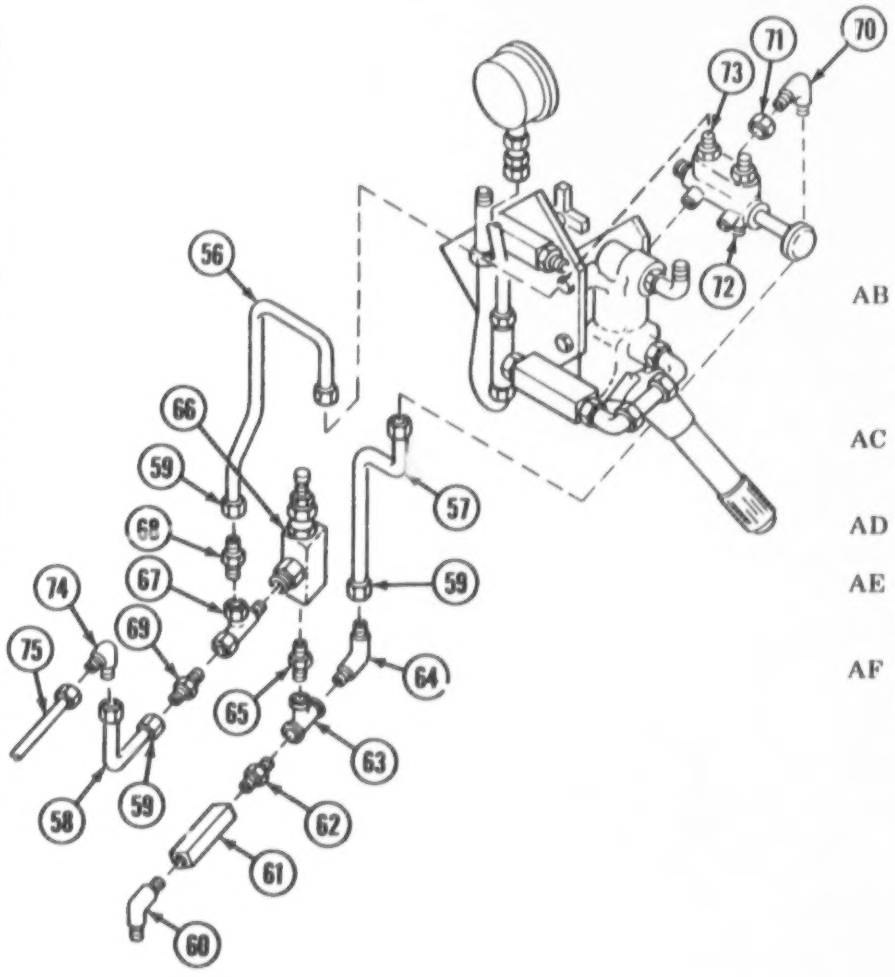
Y Remove hose assembly (52) from adapter (53).

Z Remove adapter (53) and bushing (54) from bulkhead.

AA Remove hose assembly (55) from bulkhead.

TA57523

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



AB Disconnect tube assemblies (56, 57 and 58) by loosening three tube nuts (59), and, as one assembly, remove elbow (60), valve (61), adapter (62), tee (63), elbow (64), adapter (65), valve (66), tee (67) and adapters (68 and 69). Separate components.

AC Remove tube assembly (57) from elbow (70). Loosen locknut (71) and remove elbow (70) from selector valve (72).

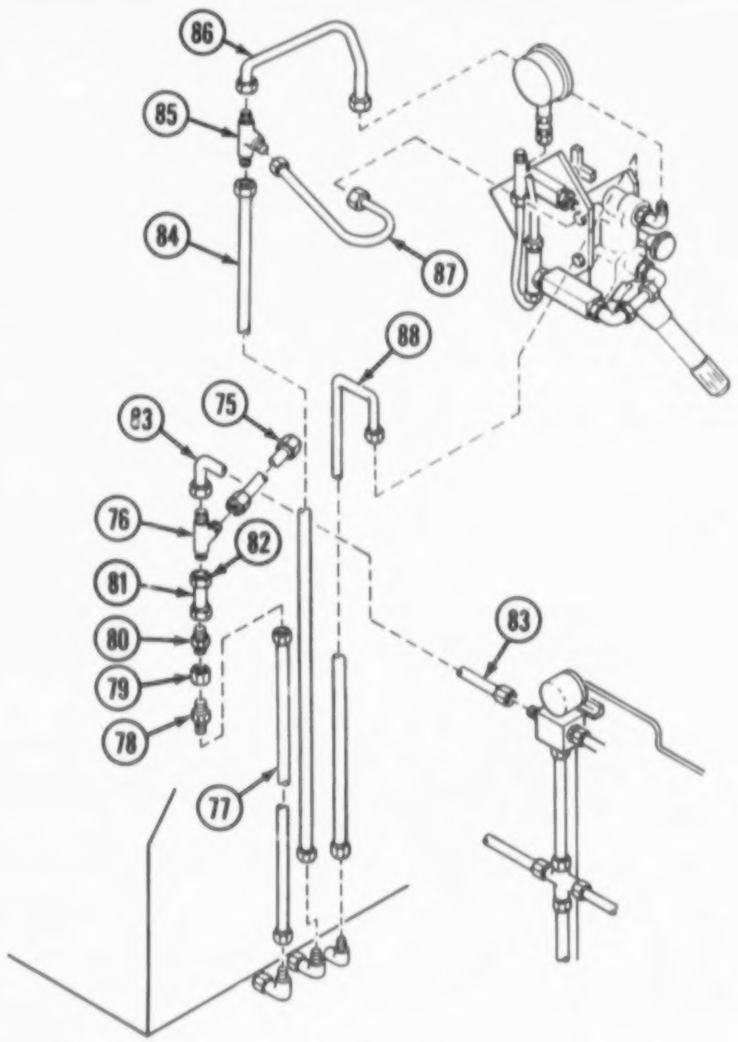
AD Remove tube assembly (56) from bushing (73).

AE Remove dome light mounted to APU compartment rear wall (p 6-40).

AF Remove tube assembly (58) from elbow (74). Remove elbow (74) from tube assembly (75).

TA57524

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



AG Remove tube (75) from tee (76).

AH As one assembly, remove tube (77), adapter (78), nut (79), adapter (80) and tube assembly (81) from tee (76) by loosening tube nut (82). Separate components.

AI Remove tube assembly (83) from tee (76) and hydraulic panel connection.

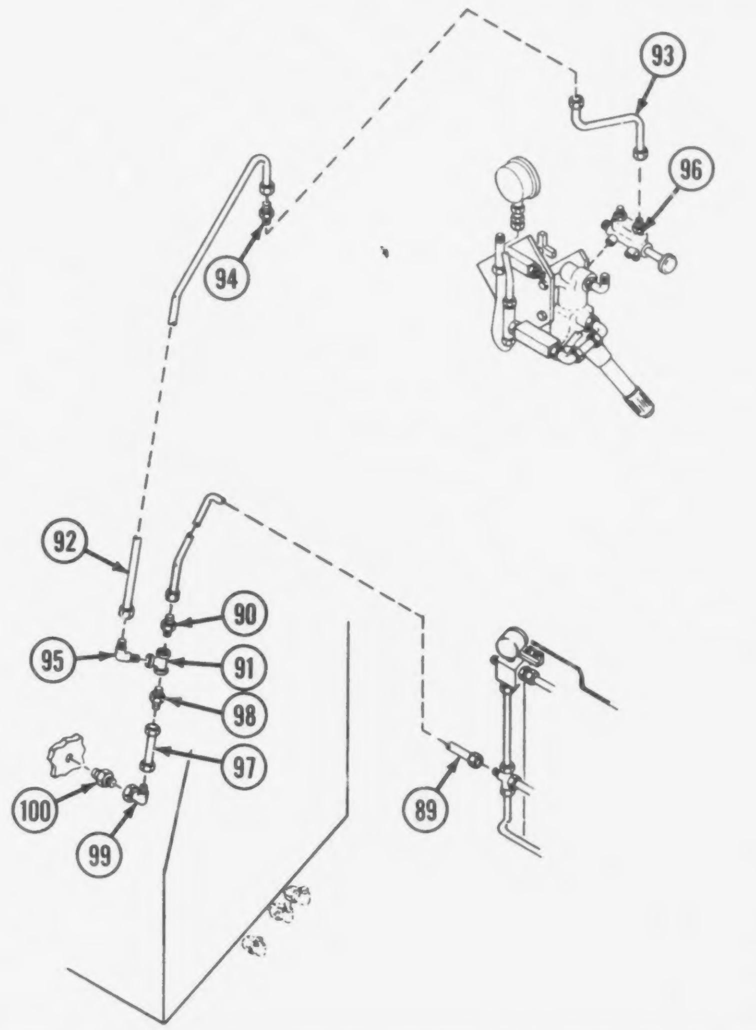
AJ Remove tube assembly (84) from tee (85).

AK Remove tube assembly (86) from tee (85) and hand pump assembly.

AL As one assembly, remove tube assembly (87) and tee (85) from hand pump assembly. Remove tee (85) from tube assembly (87).

AM Remove tube assembly (88) from hand pump assembly.

TA57525



AN Remove tube assembly (89) from hydraulic control panel connection, and adapter (90).

AO Remove adapter (90) from tee (91).

AP As one assembly, remove tube assemblies (92 and 93) and adapter (94) from elbow (95) and adapter (96). Separate components.

AQ As one assembly, remove tube assembly (97), adapter (98), tee (91) and elbow (95) from elbow (99). Separate components.

AR Remove elbow (99) and nipple (100) from bulkhead.

INSTALLATION

NOTE

Pipe sealant (item 57, Appx D) is to be applied to all male pipe threads prior to installation.

A Install nipple (100) and elbow (99) to bulkhead.

B Assemble elbow (95), tee (91), adapter (98) and tube assembly (97) and install on elbow (99).

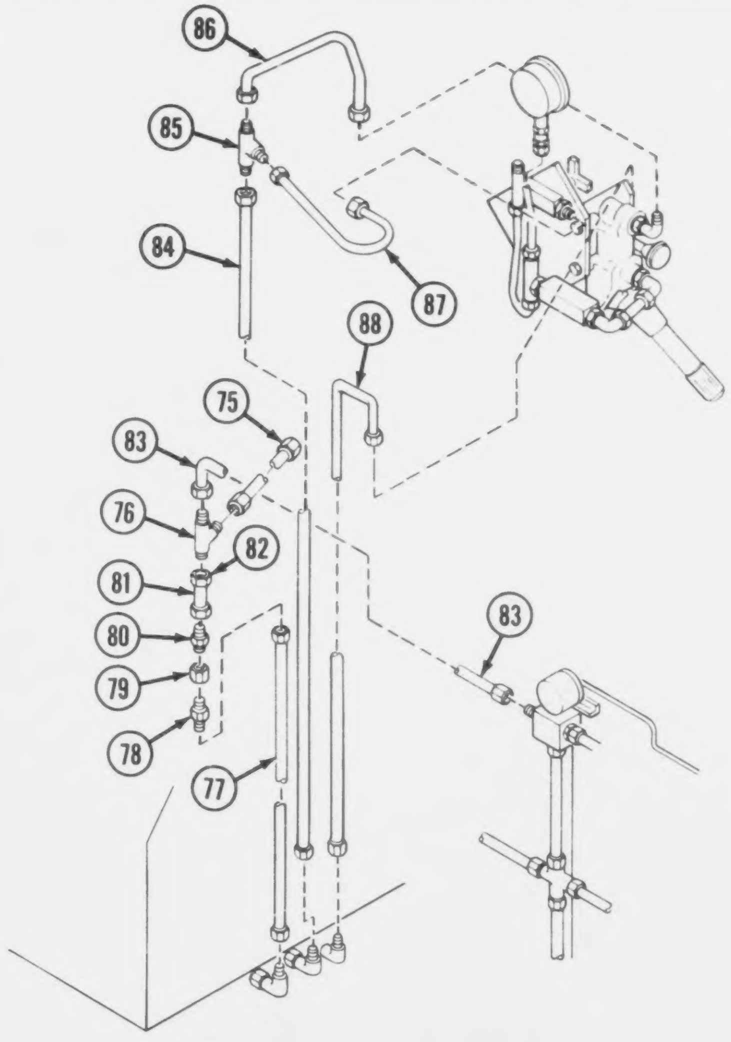
C Assemble tube assemblies (92 and 93) and adapter (94) and install on elbow (95) and adapter (96).

D Install adapter (90) on tee (91).

E Install tube assembly (89) on adapter (90) and hydraulic control panel connection.

TA57526

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



F Install tube assembly (88) on hand pump assembly.

G Assemble tee (85) and tube assembly (87) and install on hand pump assembly.

H Install tube assembly (86) on tee (85) and hand pump assembly.

I Install tube assembly (84) on tee (85).

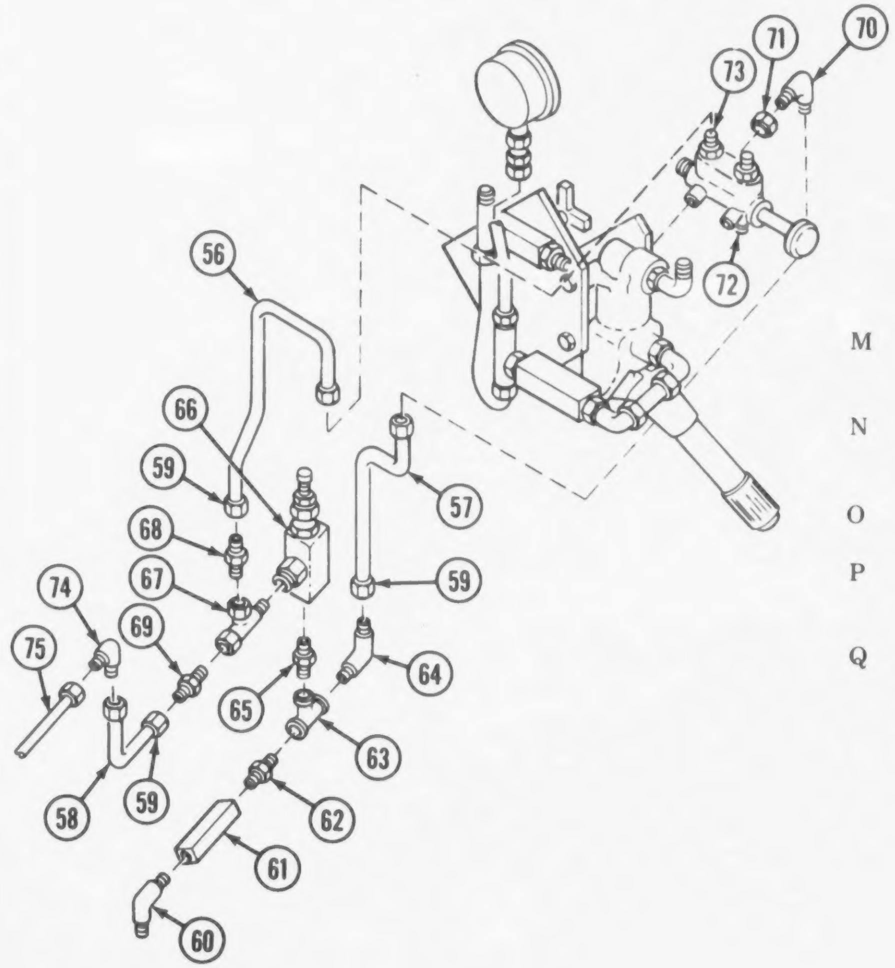
J Install tee (76) on tube assembly (83) and install on hydraulic panel connection.

K Assemble tube assembly (81), adapter (80), nut (79), adapter (78) and tube (77) and install on tee (76) by tightening tube nut (82).

L Install tube (75) on tee (76).

TA57527

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



M Install elbow (74) on tube assembly (75). Install tube assembly (58) on elbow (74).

N Install dome light mounted to APU compartment rear wall (p 6-40).

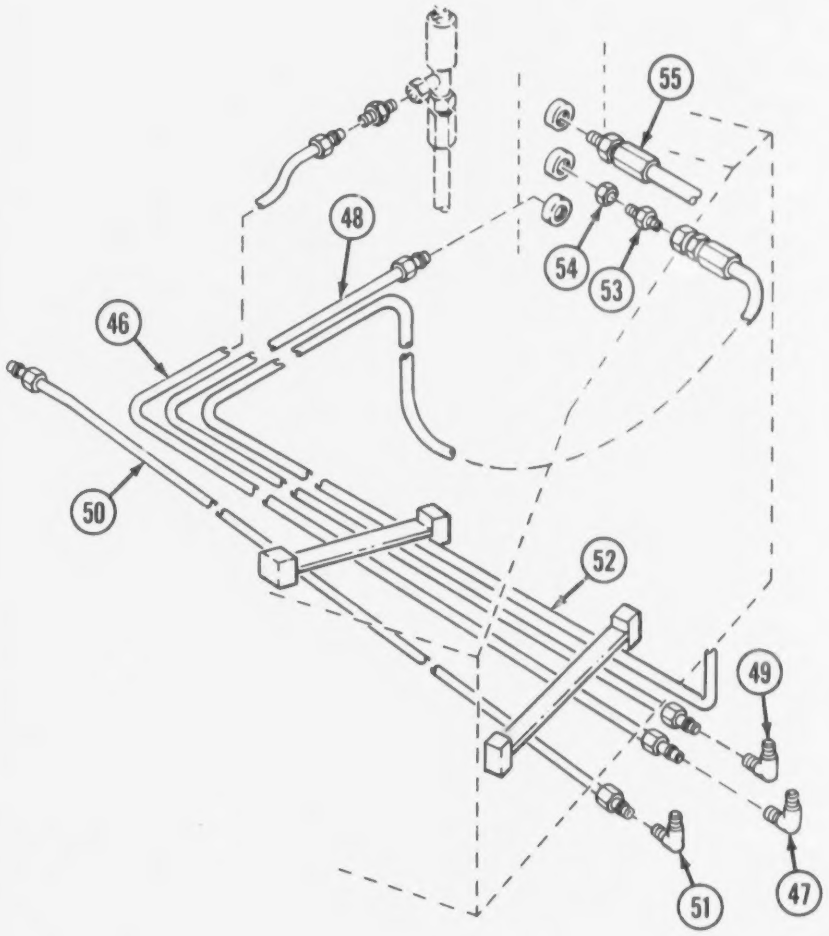
O Install tube assembly (56) on bushing (73).

P Install elbow (70) on selector valve (72) and tighten locknut (71). Install tube assembly (57) on elbow (70).

Q Install adapters (68 and 69), tee (67), valve (66), adapter (65), elbow (64), tee (63), adapter (62), valve (61) and elbow (60) and install as one assembly. Connect tube assemblies (56, 57 and 68) by tightening three tube nuts (59).

TA57528

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



R Install hose assembly (55) to bulkhead.

S Install bushings (54) and adapter (53) on bulkhead.

T Install hose assembly (52) on adapter (53).

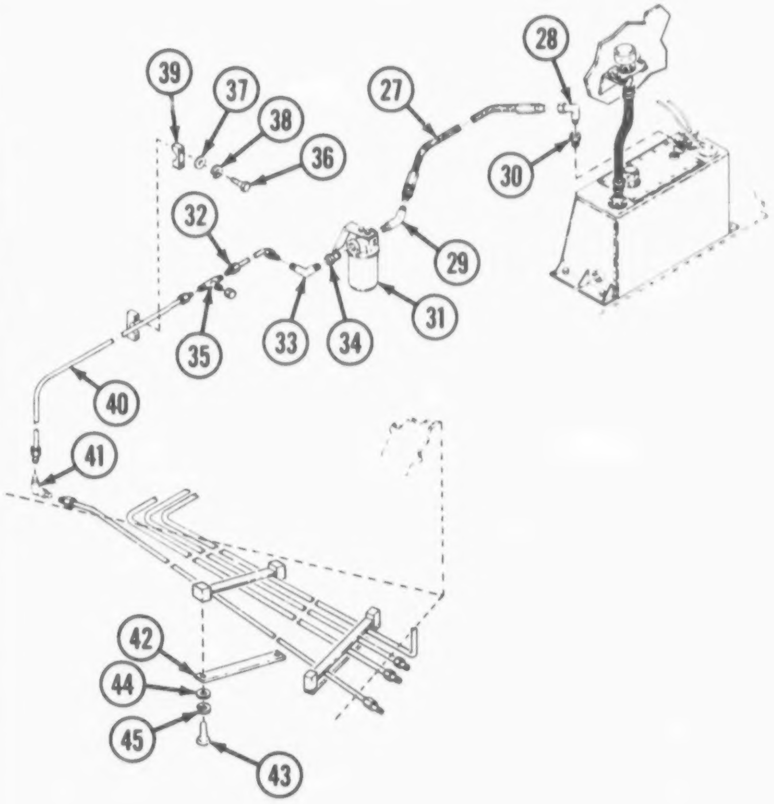
U Install elbow (51) and tube assembly (50).

V Install elbow (49) and tube assembly (48).

W Install elbow (47) and tube assembly (46).

TA57529

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



X Install two brackets (42) under APU compartment, with two flat washers (44), two new lockwashers (45) and two screws (43) for each.

Y Install elbow (41) on tube assembly (50).

Z Install tube assembly (40) on elbow (41).

AA Install clamp (39), with two new lockwashers (38), two flat washers (37) and two screws (36).

AB Install tee (35), bushing (34) and elbow (33) on tube assembly (32).

AC Install tube assembly (32).

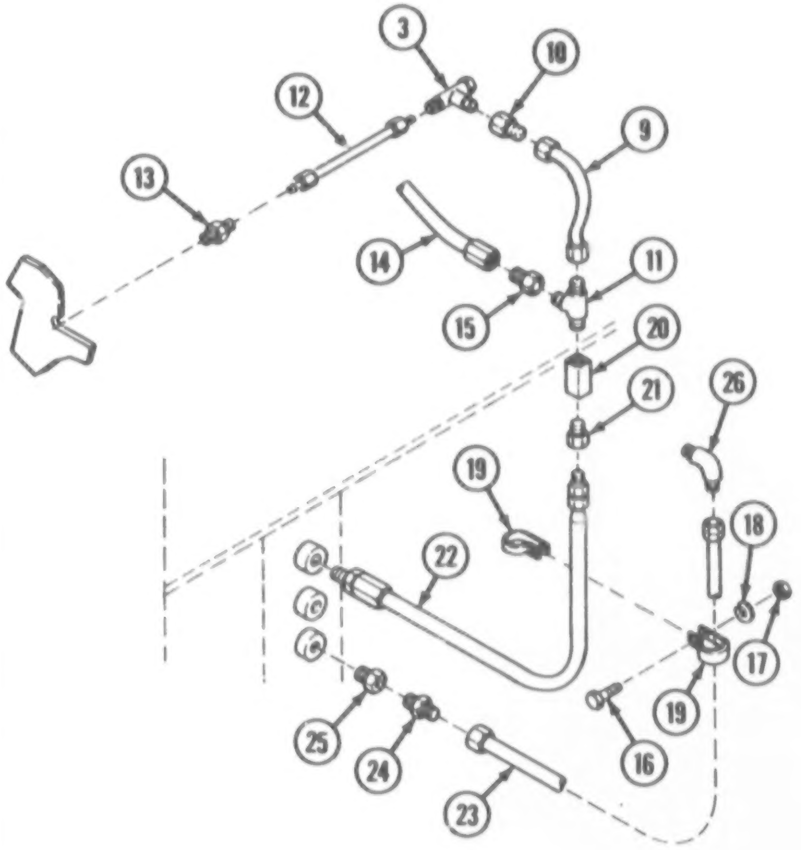
AD Install elbow (29) on filter unit (31).

AE Install bushing (30) and elbow (28).

AF Install hose assembly (27) on elbows (29 and 28).

TA57530

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



AG Install elbow (26) on tube (23).

AH Install bushing (25) and adapter (24) on bulkhead. Install and connect tube assembly (23) on adapter (24).

NOTE

During installation, free flow arrow on valve must point down.

AI Install hose (22), adapter (21) and check valve (20).

AJ Install tee (11) on check valve (20).

AK Install two clamps (19) with screw (16), new lockwasher (18) and nut (17).

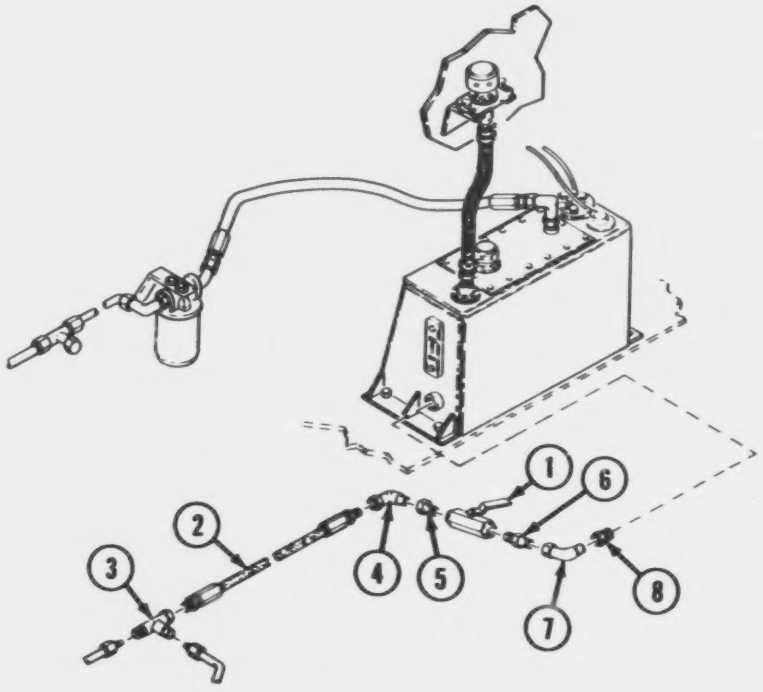
AL Install adapter (15) on tee (11) and connect line (14).

AM Install adapter (13) and tube assembly (12) on tee (3).

AN Install adapter (10) on tee (3) and tube assembly (9), and install tube assembly (9) on tee (11).

TA57531

HYDRAULIC SUCTION AND RETURN LINES, AND ASSOCIATED PARTS: REMOVAL AND INSTALLATION (CONTINUED)



AO Install bushing (8), elbow (7), nipple (6), ball valve (1), reducer (5) and elbow (4).

AP Connect hose assembly (2) to elbow (4) and tee (3).

AQ Open ball valve (1).

AR Refill hydraulic reservoir (refer to LO 9-2350-267-12).

TA57532

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BACKUP HYDRAULIC PUMP ASSEMBLY HOSES AND CONNECTING PARTS: REMOVAL AND INSTALLATION

INITIAL SETUP

Materials/Parts:

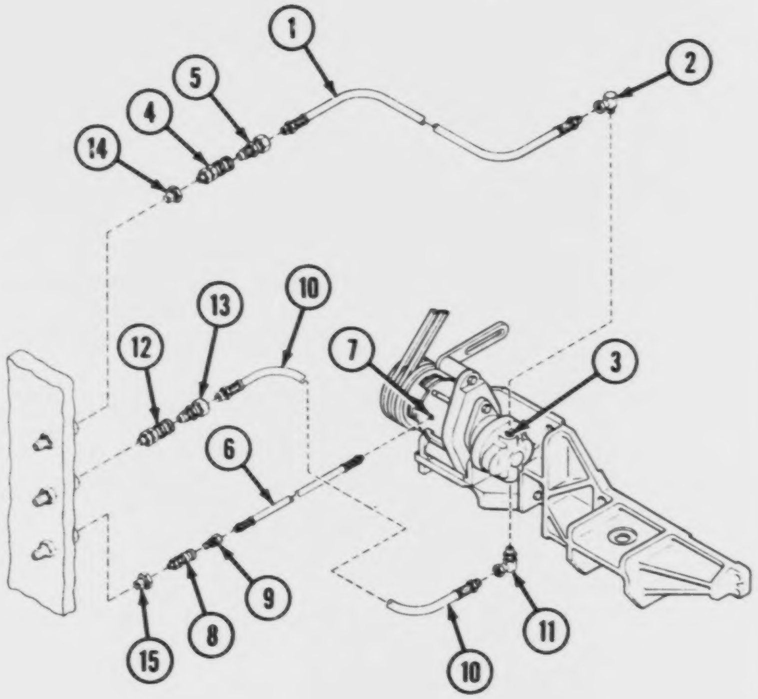
Teflon Tape (item 62, Appx D)

Equipment Condition:

Engine compartment access cover removed (p 9-25).

WARNING

- Make sure all systems are shut down and MASTER switch if OFF. Hydraulic fluid may be HOT.
- Do not perform removal procedures until backup hydraulic gage has been visually checked. Gage must show 0 psi.



TA57533

BACKUP HYDRAULIC PUMP ASSEMBLY HOSES AND CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)

REMOVAL

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

A Remove hose (1) from elbow (2).

B Remove elbow (2) from pump inlet port (3).

C Disconnect hose (1) from bulkhead quick-disconnect end (4).

D Remove quick-disconnect end (5) from hose (1).

E Remove hose (6) from clutch hydraulic port (7).

F Disconnect hose (6) from bulkhead quick-disconnect end (8).

G Remove quick-disconnect end (9) from hose (6).

H Remove hose (10) from elbow (11).

I Disconnect hose (10) from bulkhead quick-disconnect end (12).

J Remove quick-disconnect end (13) from hose (10).

K Remove quick-disconnect ends (4, 8 and 12) from bushings (14 and 15) and bulkhead hydraulic panel port.

L Remove bushings (14 and 15) from bulkhead hydraulic panel ports.

INSTALLATION

NOTE

Apply Teflon tape (item 62, Appx D) to all male threads during installation.

A Install bushings (14 and 15) in bulkhead hydraulic panel ports.

B Install quick-disconnect ends (4, 8 and 12) on bushings (14 and 15) and bulkhead hydraulic panel ports.

C Install quick-disconnect end (13) on hose (10).

D Connect hose (10) to bulkhead quick-disconnect end (12).

E Install hose (10) on elbow (11).

F Install quick-disconnect end (9) on hose (6).

G Connect hose (6) to bulkhead quick-disconnect end (8).

H Install hose (6) on clutch hydraulic port (7).

I Install quick-disconnect end (5) on hose (1).

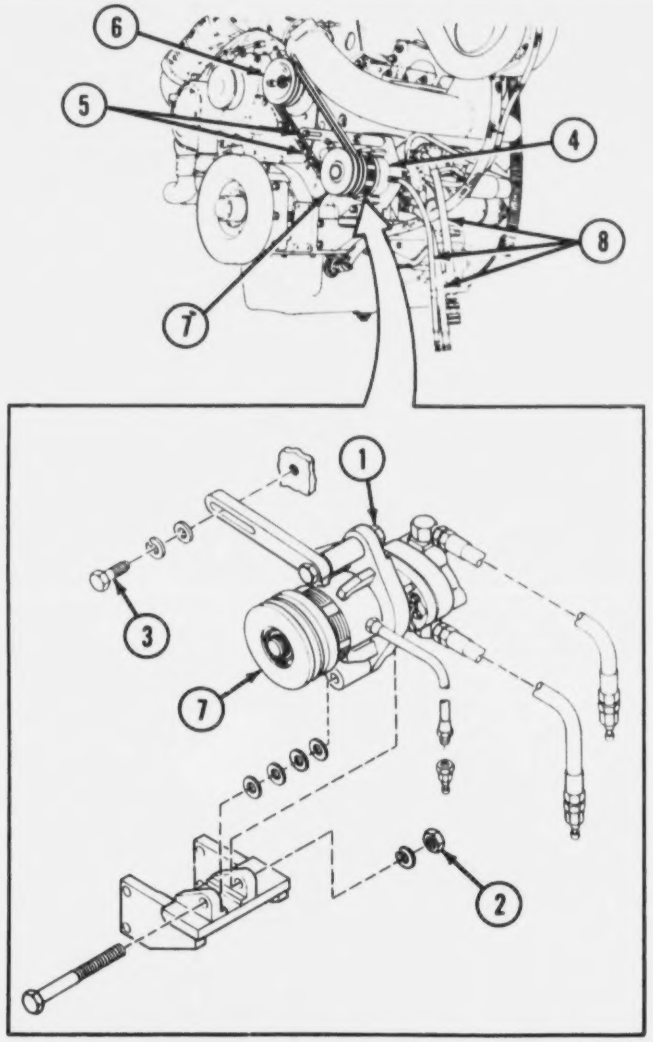
J Connect hose (1) to bulkhead quick-disconnect end (4).

K Install elbow (2) in pump inlet port (3).

L Install hose (1) on elbow (2).

TA57534

BACKUP HYDRAULIC SYSTEM, CLUTCH SUPPORT AND PUMP ASSEMBLY: REMOVAL AND INSTALLATION



INITIAL SETUP

References:

TM 9-2350-267-10

Equipment Condition:

MASTER switch turned OFF.
Engine access cover removed (p 9-25).

General Safety Instructions:

Check hydraulic hand pump pressure gage. Gage must indicate 0 psi. If not, relieve hand pump system pressure before disconnecting backup hydraulic pump hoses (TM 9-2350-267-10).

REMOVAL

A Loosen two nuts (1 and 2) and screw (3).

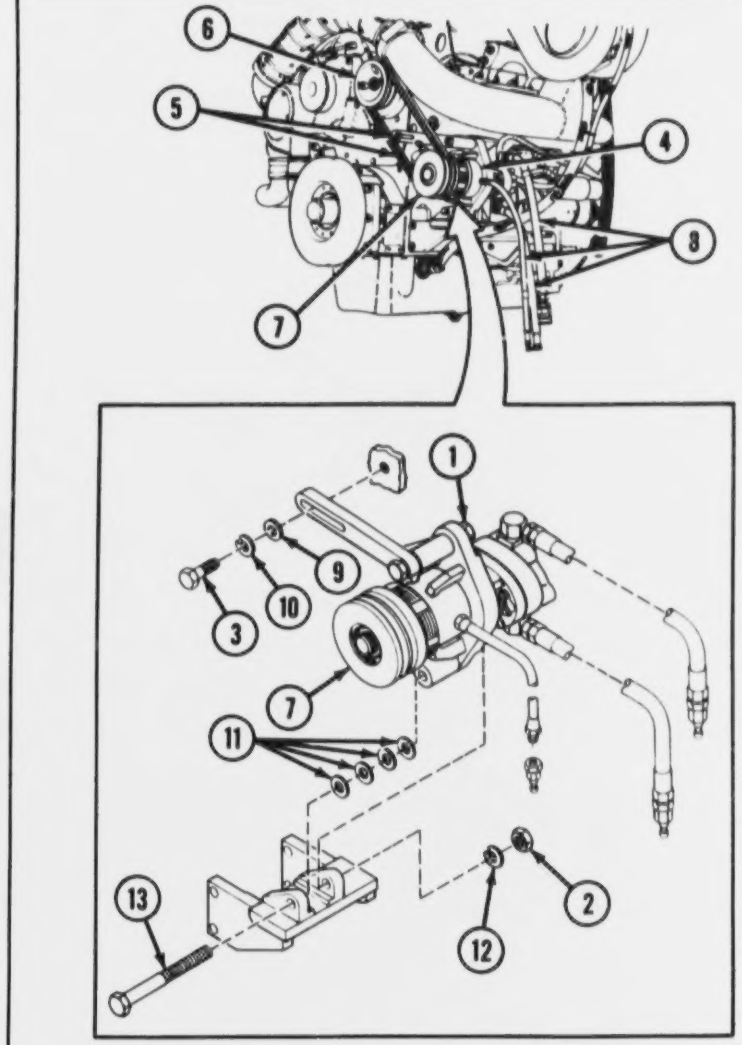
B Move pump (4) to left, releasing tension on two V-belts (5).

C Remove V-belts (5) from around engine crankshaft pulley (6) and pump sheave (7).

D Disconnect three hydraulic hoses (8) from engine compartment wall quick-disconnect fittings.

TA57535

BACKUP HYDRAULIC SYSTEM, CLUTCH SUPPORT AND PUMP ASSEMBLY: REMOVAL AND INSTALLATION (CONTINUED)



CAUTION

The pump assembly weighs approximately 55 pounds. Wood blocking should be placed under it to prevent it from falling out of place when mounting screws are removed.

E Remove screw (3), shim washers (9) and lockwasher (10). Discard lockwasher.

F Remove nut (2), shim washers (11), lockwashers (12) and screw (13). Discard lockwashers.

G Remove pump assembly (4) from vehicle.

INSTALLATION

A Install pump assembly (4) to vehicle.

B Install screw (13), shim washers (11), new lockwashers (12) and nut (2).

C Install screw (3), new lockwasher (10) and shim washers (9).

D Connect three hydraulic hoses (8) to engine compartment wall quick-disconnect fittings.

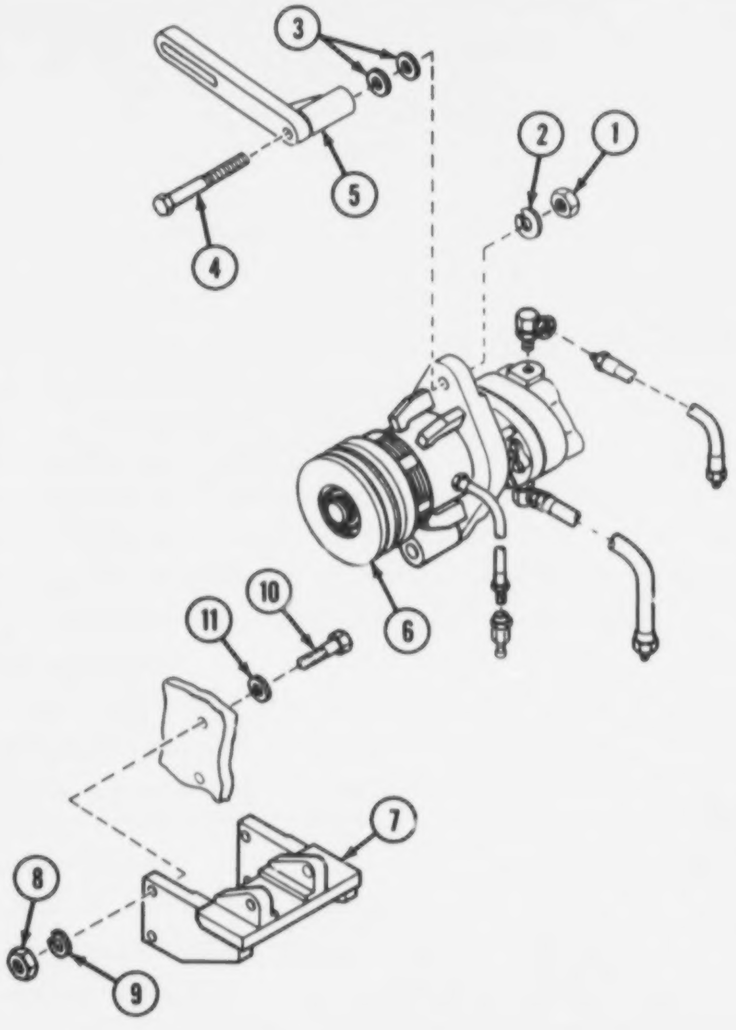
E Install V-belts (5) around engine crankshaft pulley (6) and pump sheave (7).

F Aline V-belts (5) (p 16-26).

G Tighten two nuts (1 and 2) and screw (3).

TA57536

BACKUP HYDRAULIC PUMP BRACKET AND SUPPORT: REMOVAL AND INSTALLATION



INITIAL SETUP

Equipment Condition:

Pump assembly removed (p 16-23).

REMOVAL

A Remove nut (1), lockwasher (2), shim washers (3), screw (4) and support (5) from pump assembly (6). Discard lockwasher.

B Remove bracket (7) from main engine by removing four nuts (8), four lockwashers (9), four screws (10) and four flat washers (11). Discard lockwashers.

INSTALLATION

A Install bracket (7) to main engine by installing four nuts (8), four new lockwashers (9), four screws (10) and four flat washers (11).

B Install nut (1), new lockwasher (2), shim washers (3), screw (4) and support (5) to pump assembly (6).

TA57537

BACKUP HYDRAULIC SYSTEM SHEAVE, CLUTCH, SUPPORT AND HYDRAULIC PUMP: DISASSEMBLY AND ASSEMBLY

INITIAL SETUP

Test Equipment/Special Tools:

Pliers, snapring (item 53, Appx B)

Materials/Parts:

Adhesive, type I (item 73, Appx D)
Adhesive, sealant (item 5, Appx D)

Equipment Condition:

Clutch, support and pump assembly removed (p 16-23).

DISASSEMBLY

A Disconnect two hydraulic lines (1) from elbows (2).

B Remove hydraulic line (3) from port connection of clutch (4).

C Remove two elbows (2) from pump (5).

D Remove two screws (6), two lockwashers (7) and pump (5) from support (8). Discard lockwashers.

E Remove key (9) from pump shaft (10).

F Remove snapring (11) from sheave mounting shaft (12).

G Remove sheave (13) with attached cup (14) from sheave mounting shaft (12).

H Remove three screws (15) and cup (14) from sheave (13).

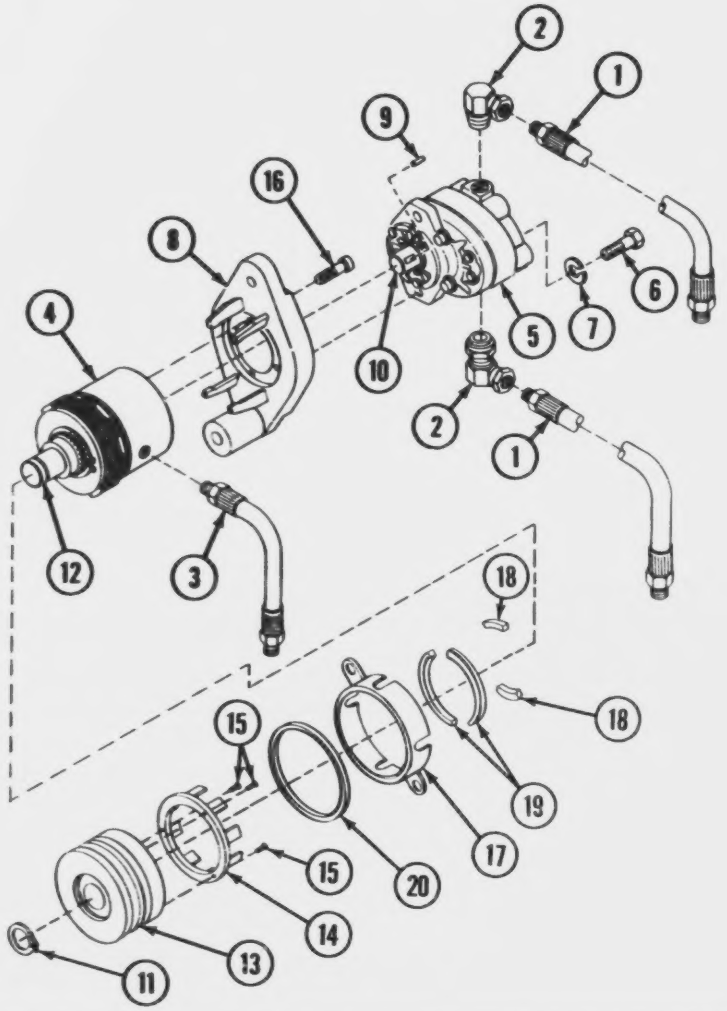
I Remove support (8) from clutch (4) by removing four self-locking screws (16). Discard self-locking screws.

NOTE

Steps J and K only apply to vehicles 487 and above.

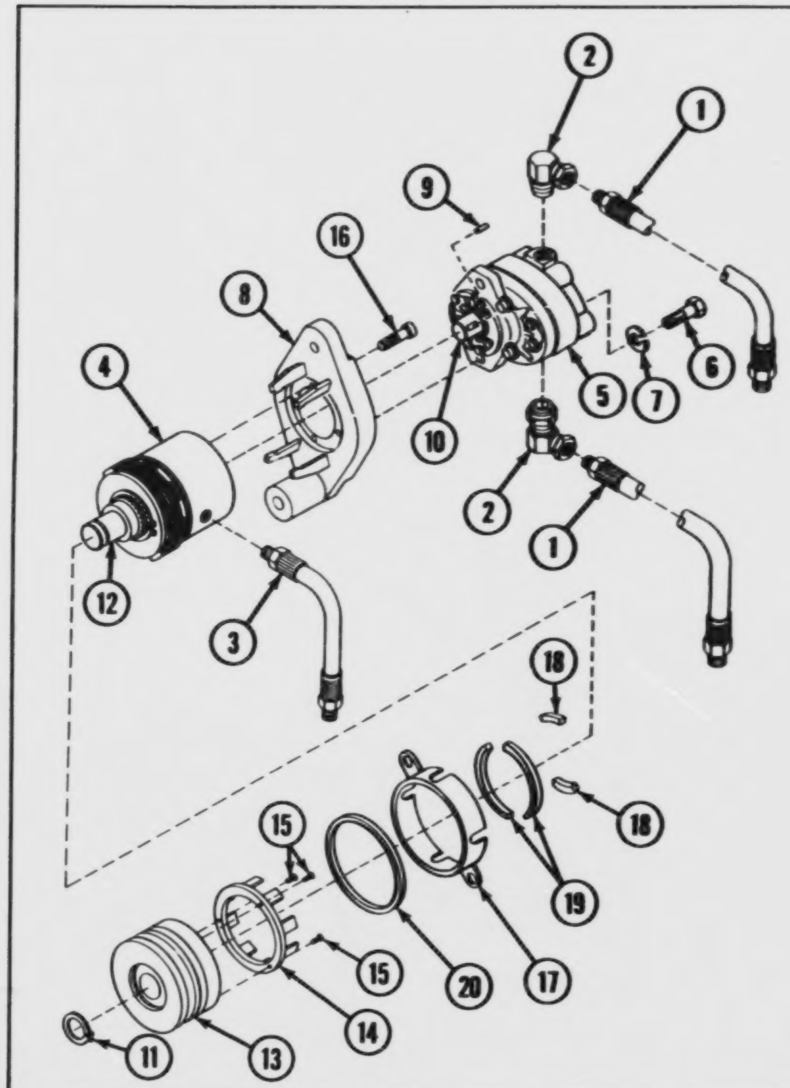
J Remove cover assembly (17) from clutch (4).

K Remove and discard five seals (18, 19, 20).



TA57304

BACKUP HYDRAULIC SYSTEM SHEAVE, CLUTCH, SUPPORT AND HYDRAULIC PUMP: DISASSEMBLY AND ASSEMBLY (CONTINUED)



ASSEMBLY

NOTE

Do step A for vehicles 487 and above. For vehicles 1-486 go to step B.

A Install new seal (20) on cover assembly (17) using adhesive, type 1 (item 73, Appx D).

B Install support (8) on clutch (4) with four new self-locking screws (16).

C Install cup (14) on sheave (13) with three screws (15).

D Install sheave (13) with cup (14) on sheave mounting shaft (12) and secure with snapring (11).

E Install key (9) in keyway of pump shaft (10) and insert pump shaft (10) in shaft of clutch (4), making sure key engages keyway of clutch shaft.

F Install pump (5) on support (8) with two screws (6) and two new lockwashers (7).

NOTE

Do steps G and H for vehicles 487 and above. For vehicles 1-486 go to step I.

G Install cover assembly (17) on clutch (4).

H Install four new seals (18, 19) using sealant adhesive (item 5, Appx D) to bond seals to clutch (4) and cover assembly (17). Close all holes and gaps with sealant.

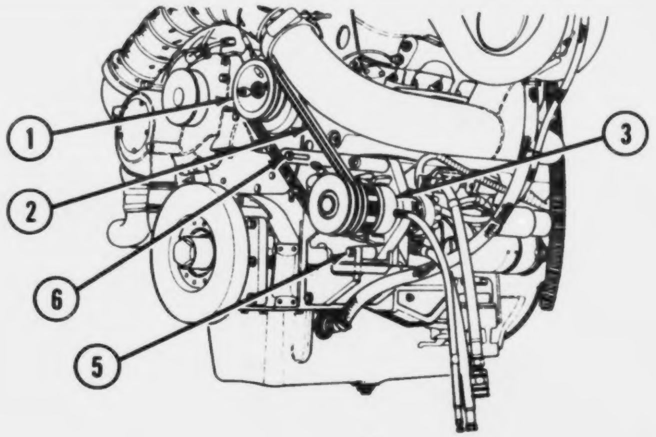
I Install two elbows (2) in ports of pump (5).

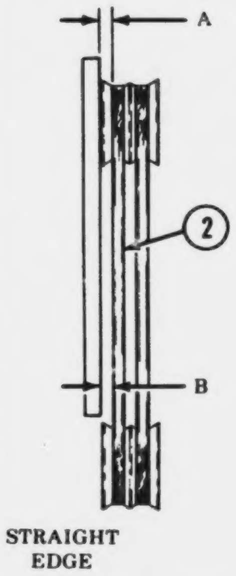
J Install hydraulic line (3) in port connection of clutch (4).

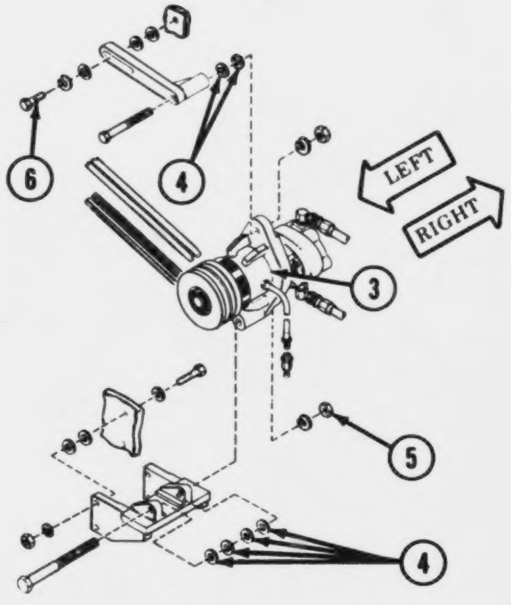
K Connect two hydraulic lines (1) to elbows (2).

TA57305

BACKUP HYDRAULIC PUMP ASSEMBLY V-BELT: ALINEMENT AND TENSION ADJUSTMENT







ALINEMENT

A Lay straight edge on face of engine pulley (1). Position straight edge parallel to outer V-belt (2).

B Measure distance between straight edge and edge of V-belt (2) at point A.

C Measure distance between straight edge and edge of V-belt (2) at point B.

D Distance B should differ no more than ±1/8 inch from distance A.

E To move pump assembly (3) right, install required number of flat washers (4).

F To move pump assembly (3) left, remove required number of flat washers (4).

ADJUSTMENT

A Loosen nut (5) and screw (6).

B Move pump assembly (3) forward to decrease V-belt tension or back to increase tension.

C Position pump assembly (3) so V-belts will depress 3/8 to 5/8 inch.

NOTE

Depress V-belts midway between engine pulley and pump sheave.

D Tighten nut (5) and screw (6).

TA57538

Section V HAND PUMP ASSEMBLY AND SELECTOR VALVE

HAND PUMP ASSEMBLY AND SELECTOR VALVE: REMOVAL AND INSTALLATION

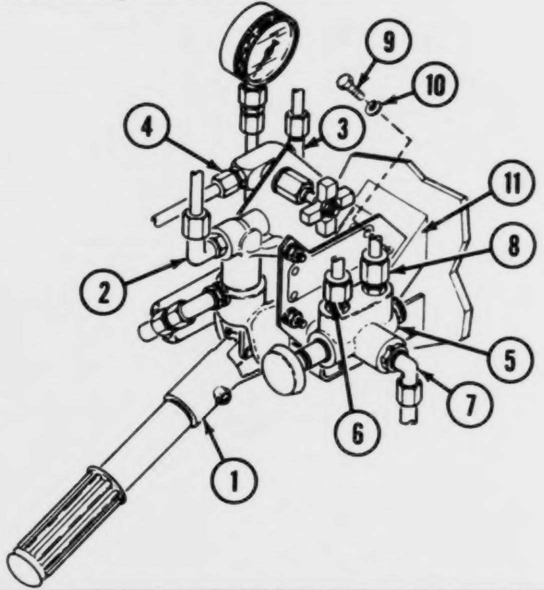
INITIAL SETUP

Materials/Parts:

Pipe sealant, (item 57, Appx D)
Nonhygroscopic tape (item 61, Appx D)

General Safety Instructions:

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.



CAUTION

Take necessary precautions to prevent entry of contaminants into hydraulic system. Hydraulic lines and ports should be capped immediately after disconnecting lines to avoid entry of contaminants into system.

NOTE

Do not perform removal procedures until backup hydraulic gage has been checked visually. Gage must show 0 psi.

REMOVAL

A Disconnect three hydraulic tubes from hand pump assembly (1) at elbow (2), tee (3) and adapter (4).

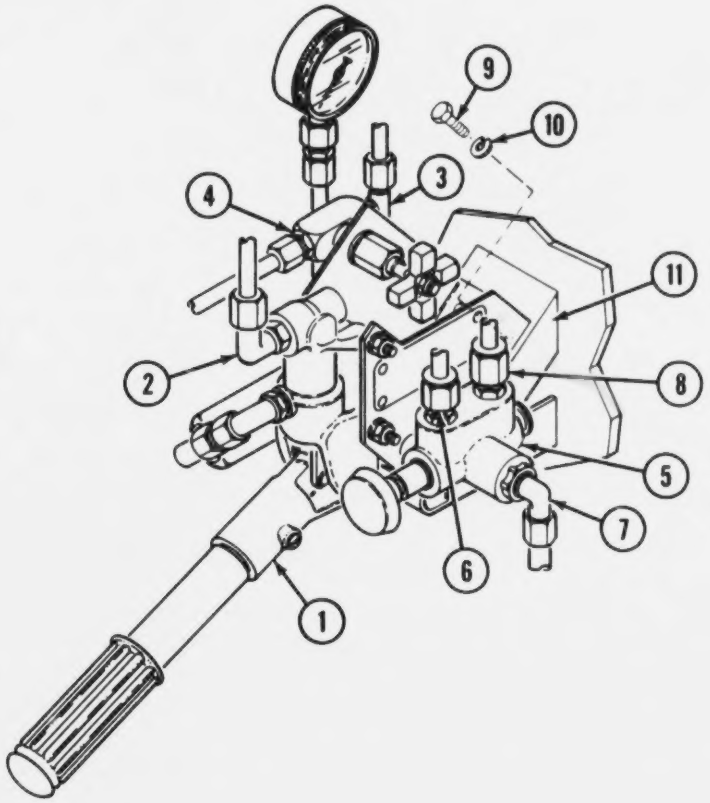
B Disconnect three hydraulic tubes to selector valve (5) at connector (6), elbow (7) and connector (8).

C Remove two screws (9) and two lockwashers (10) that secure hand pump assembly (1) to cab-mounted bracket (11). Discard lockwashers.

D Seal off all openings to hand pump (1), selector valve (5) and tubing with nonhygroscopic tape (item 61, Appx D).

TA58013

HAND PUMP ASSEMBLY AND SELECTOR VALVE: REMOVAL AND INSTALLATION (CONTINUED)



INSTALLATION

A Apply pipe sealant (item 57, Appx D) to all male pipe threads.

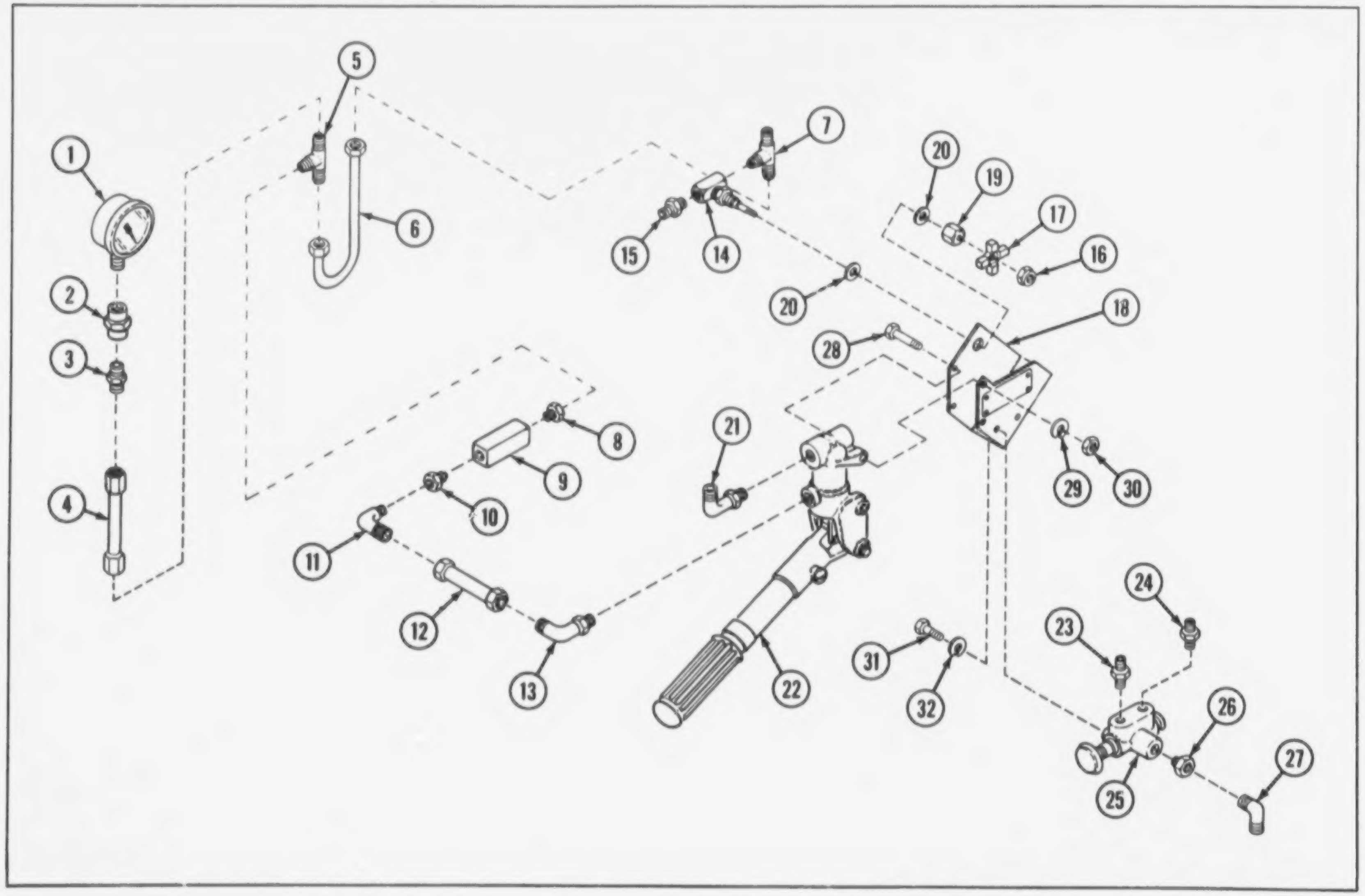
B Install hand pump assembly (1) to cab-mounted bracket (11) and secure with two screws (9), and two new lockwashers (10).

C Connect three hydraulic tubes to selector valve (5), at connector (6), elbow (7) and connector (8).

D Connect three hydraulic tubes to hand pump assembly (1) at elbow (2), tee (3) and adapter (4).

TA58012

HAND PUMP ASSEMBLY AND SELECTOR VALVE: DISASSEMBLY AND ASSEMBLY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TA58011

HAND PUMP ASSEMBLY AND SELECTOR VALVE: DISASSEMBLY AND ASSEMBLY (CONTINUED)

NOTE

Tag all components for identification at installation.

DISASSEMBLY

A Remove gage (1) from connector (2).

B Remove connector (2), adapter (3) and tube (4) from tee (5).

C Remove tube (6) from tees (5 and 7).

D Remove tee (5), reducer (8), check valve (9), reducer (10), elbow (11), tube (12) and elbow (13).

E Remove tee (7) from valve (14).

F Remove adapter (15) from valve (14).

G Remove nut (16) and handle (17) from valve (14).

H Remove valve (14) from bracket (18) by removing nut (19) and two washers (20).

I Remove elbow (21) from pump (22).

J Remove connectors (23 and 24) from selector valve (25).

K Remove nut (26) and elbow (27) from selector valve (25).

L Remove hand pump (22) from bracket (18) by removing two screws (28), two lockwashers (29) and two nuts (30).

M Remove selector valve (25) from bracket (18) by removing two screws (31) and two lockwashers (32).

ASSEMBLY

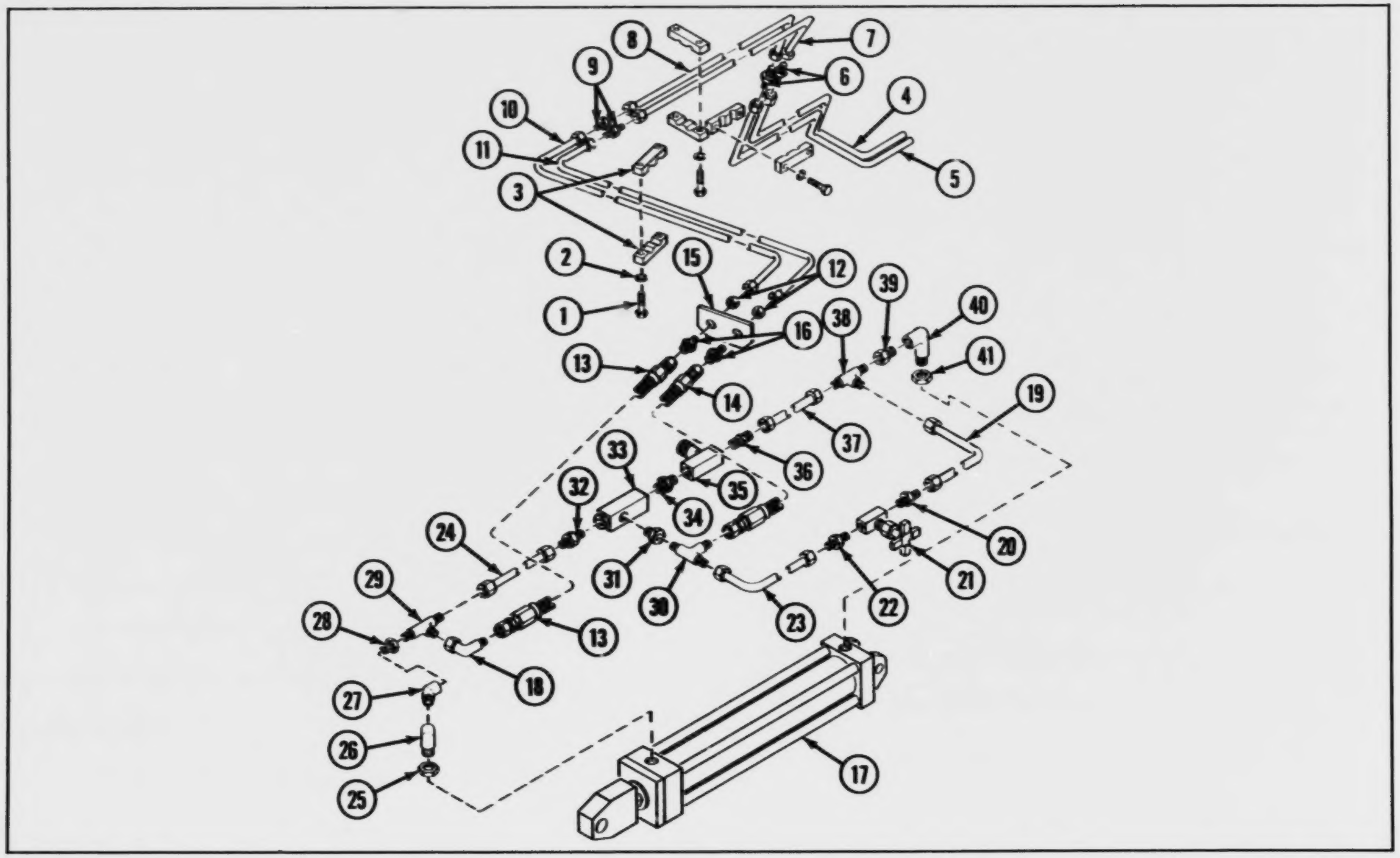
A Apply pipe sealant (item 57, Appx D) to all male pipe threads.

B Reverse disassembly procedures.

TA310778

Section VI UPPER REAR DOOR HYDRAULIC ACTUATOR

UPPER REAR DOOR HYDRAULIC ACTUATOR TUBES, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION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TA310779

UPPER REAR DOOR HYDRAULIC ACTUATOR TUBES, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)

NOTE

Tag all parts for proper identification at assembly.

REMOVAL

WARNING

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Take necessary precautions to prevent entry of contaminants into hydraulic system. Hydraulic lines and ports should be capped immediately after disconnecting lines to avoid entry of contaminants into system.

A Remove two screws (1) and two lockwashers (2) from each of two clamps (3).

B Remove clamps (3).

C Disconnect hoses (4 and 5) from two adapters (6).

D Remove two adapters (6).

NOTE

Remove stowage net to gain access to components (p 10-10).

E Remove two tube assemblies (7 and 8).

F Remove two adapters (9).

G Remove two tube assemblies (10 and 11).

H Remove two nuts (12) and disconnect hose assemblies (13 and 14) from ceiling bracket (15).

I Remove two nipples (16) from hose assemblies (13 and 14).

NOTE

If necessary, remove actuator (17) if maintenance procedure requires complete disassembly (p 9-30).

J Remove two hose assemblies (13 and 14).

K Remove elbow (18).

L Remove tube assembly (19), adapter (20), valve (21), adapter (22) and tube assembly (23) as an assembly. Disassemble components if necessary.

M Loosen tube assembly (24). Loosen locknut (25) and turn elbow (26) to disconnect tube assembly (24). Remove tube assembly (24), elbows (26 and 27), adapter (28) and tee (29) as an assembly. Separate components if necessary.

N Remove tee (30) and adapters (31).

O Remove adapter (32), pilot check valve (33), adapter (34), flow control valve (35), connector (36), tube assembly (37), tee (38), adapter (39) and elbow (40).

P Remove nut (41) from elbow (40).

INSTALLATION

A Install control valve (35) with metered flow arrow pointing toward rear of vehicle.

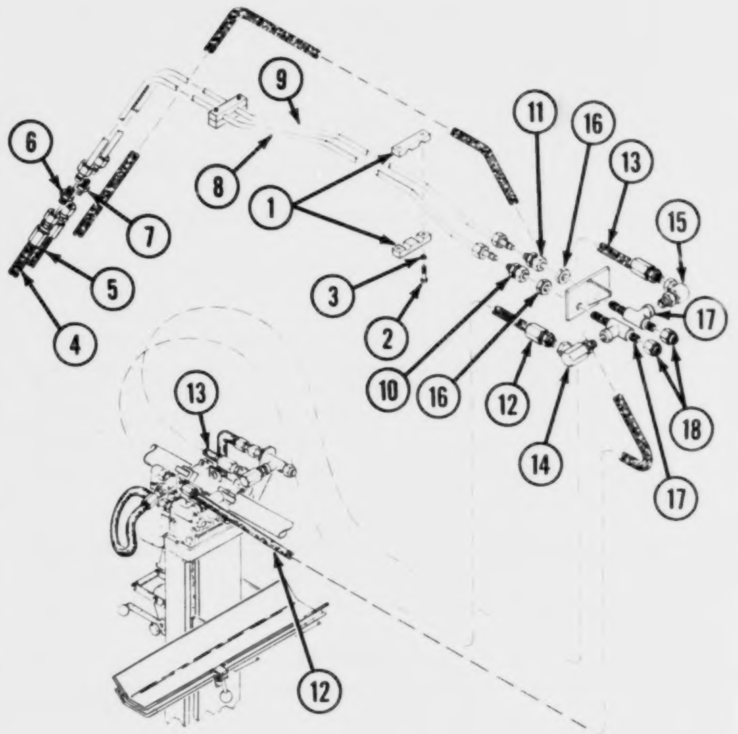
B Install pilot check valve (33) with free flow arrow pointing toward front of vehicle.

C Apply pipe sealant (item 57, Appx D) to all male pipe threads.

D Reverse removal procedures.

TA310780

STACKER HYDRAULIC TUBING, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION



WARNING

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting to prevent contaminants from entering hydraulic system and hydraulic components.

NOTE

Tag all hydraulic components for identification at installation.

REMOVAL

A Remove two clamps (1) by removing four screws (2) and four lockwashers (3). Discard lockwashers.

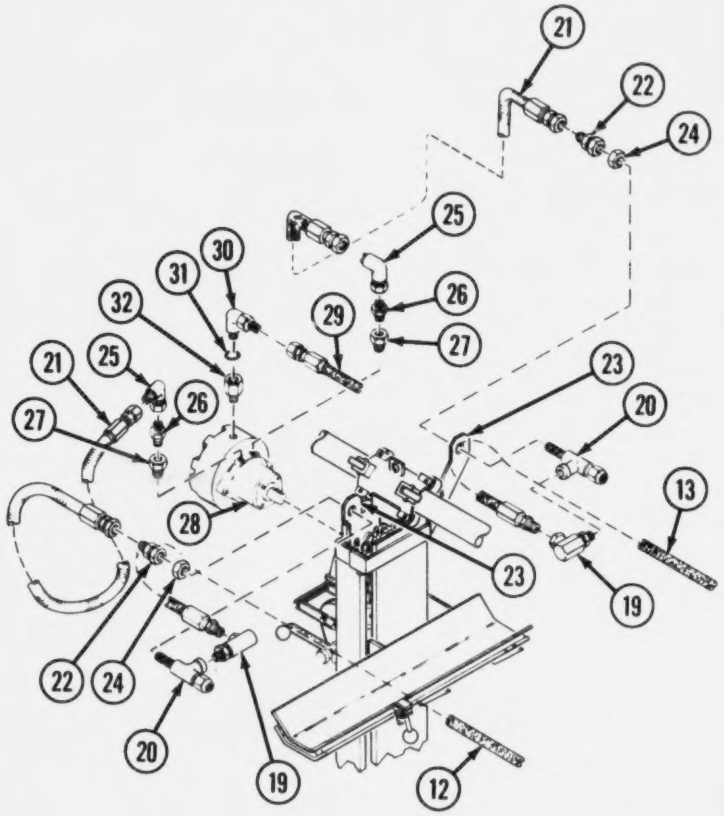
B Disconnect hoses (4 and 5) from nipples (6 and 7). Remove nipple (6 and 7) from tubes (8 and 9).

C Disconnect tubes (8 and 9) from tube reducers (10 and 11). Remove reducers (10 and 11).

D Disconnect hoses (12 and 13) from elbows (14 and 15). Remove elbows (14 and 15).

TA313160

STACKER HYDRAULIC TUBING, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)



E Remove two nuts (16), two tees (17) and two caps (18).

F Disconnect hoses (12 and 13) from elbows (19).

G Remove elbows (19) from tee fittings (20).

H Disconnect two hoses (21) from two reducers (22).

I Remove two reducers (22).

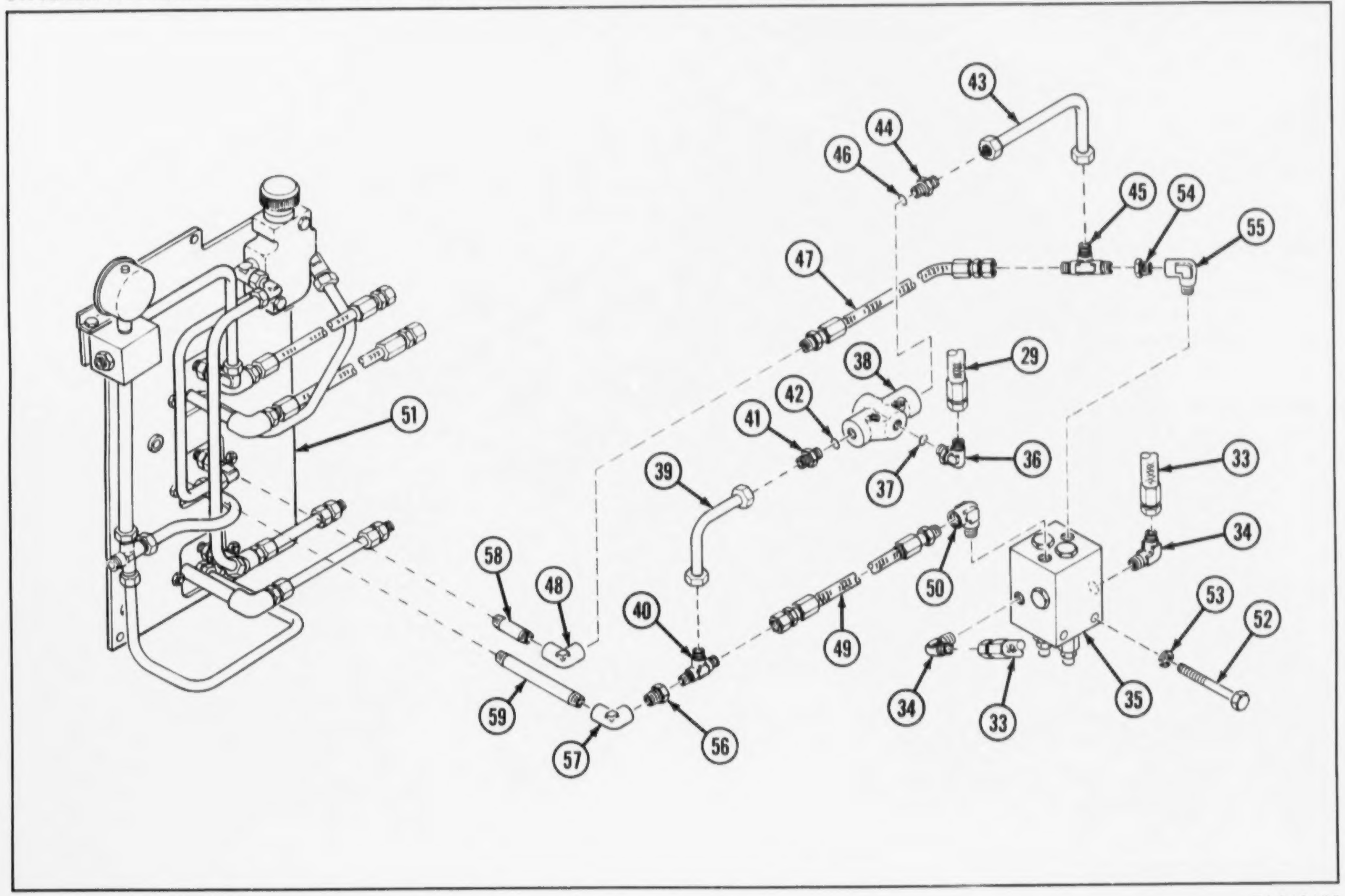
J Disconnect two tee fittings (20) from stacker assembly bracket (23) by removing two nuts (24).

K Remove two hoses (21), two elbows (25), two adapters (26) and two reducers (27) from hydraulic motor assembly (28).

L Disconnect hose (29) from elbow (30). Remove elbow (30), packing (31) and expander (32) from hydraulic motor assembly (28). Discard packing.

TA313161

STACKER HYDRAULIC TUBING, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)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TA313162

STACKER HYDRAULIC TUBING, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)

M Disconnect two hoses (33) from elbows (34). Remove elbows (34) from counterbalance valve (35).

N Disconnect hose (29) from elbow (36). Remove elbow (36) and packing (37) from shuttle valve (38). Discard packing.

O Disconnect tube (39) from tee (40) and adapter (41). Remove adapter (41) and packing (42) from shuttle valve (38). Discard packing.

P Disconnect tube (43) from adapter (44) and tee (45). Remove adapter (44) and packing (46) from shuttle valve (38). Discard packing.

Q Disconnect hose (47) from tee (45) and elbow (48).

R Disconnect hose (49) from elbow (50) and tee (40).

S Remove counterbalance valve (35) by removing two screws (52) and two lockwashers (53). Discard lockwashers.

T Remove tee (45), bushing (54) and elbows (50 and 55) from counterbalance valve (35).

U Remove tee (40) and bushing (56) from elbow (57).

V Remove elbows (48 and 57) from nipples (58 and 59).

W Remove nipples (58 and 59) from back of hydraulic control panel (51).

INSTALLATION

NOTE

Apply pipe sealant (item 57, Appx D) to all male pipe threads prior to installation.

A Install nipples (58 and 59) to back of hydraulic control panel (51).

B Install elbows (48 and 57) on nipples (58 and 59).

C Install bushing (56) and tee (40) on elbow (57).

D Install elbows (50 and 55), bushing (54) and tee (45) on counterbalance valve (35).

E Install counterbalance valve (35) with two screws (52) and two new lockwashers (53).

F Connect hose (49) to elbow (50) and tee (40).

G Connect hose (47) to tee (45) and elbow (48).

H Install new packing (46) and adapter (44) on shuttle valve (38). Connect tube (43) to adapter (44) and tee (45).

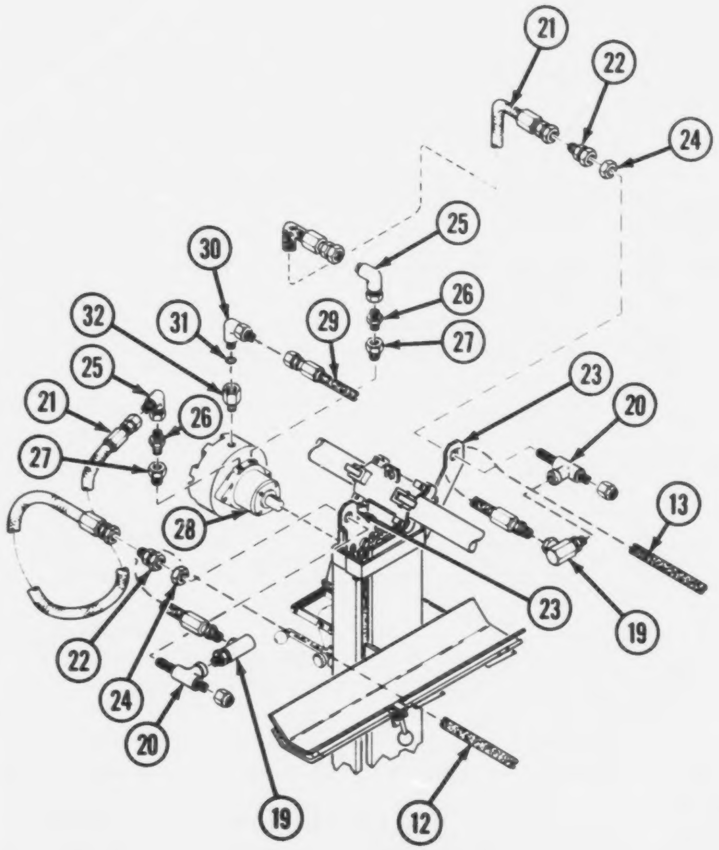
I Install new packing (42) and adapter (41) on shuttle valve (33). Connect tube (39) to adapter (41) and tee (40).

J Install new packing (37) and elbow (36) on shuttle valve (38). Connect hose (29) to elbow (36).

K Install two elbows (34) on counterbalance valve (35). Connect two hoses (33) to two elbows (34).

TA313163

STACKER HYDRAULIC TUBING, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)



L Install expander (32), new packing (31) and elbow (30) on stacker motor assembly (28). Connect hose (29) to elbow (30).

M Install two reducers (27), two adapters (26), two elbows (25) and two hoses (21) on hydraulic motor assembly (28).

N Install two tee fittings (20) to stacker assembly bracket (23) with two nuts (24).

O Install two reducers (22).

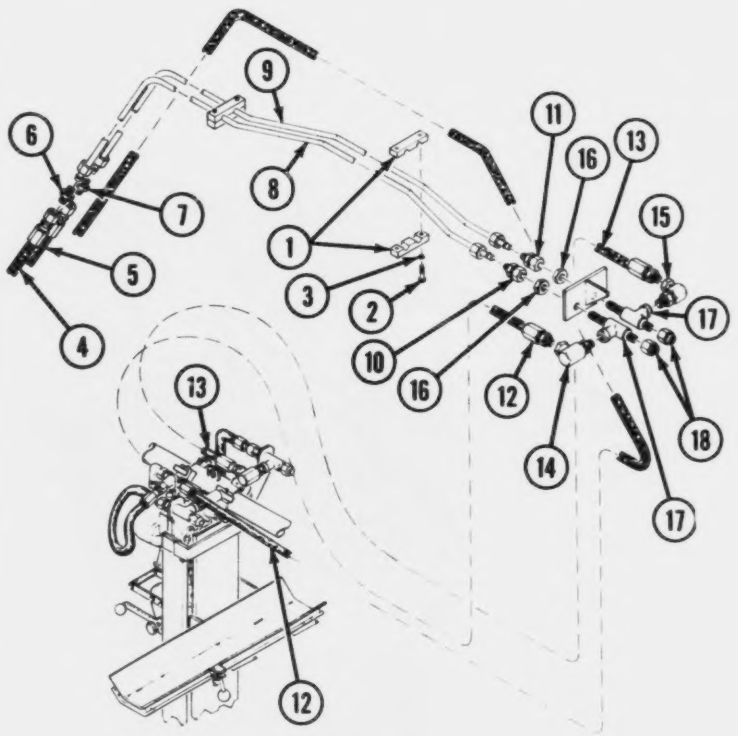
P Connect two hoses (21) to two reducers (22).

Q Install elbows (19) on tee fittings (20).

R Connect hoses (12 and 13) to elbows (19).

TA313164

STACKER HYDRAULIC TUBING, HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)



S Install two caps (18), two tees (17) and two nuts (16).

T Install two elbows (14 and 15) and connect hoses (12 and 13) to elbows (14 and 15).

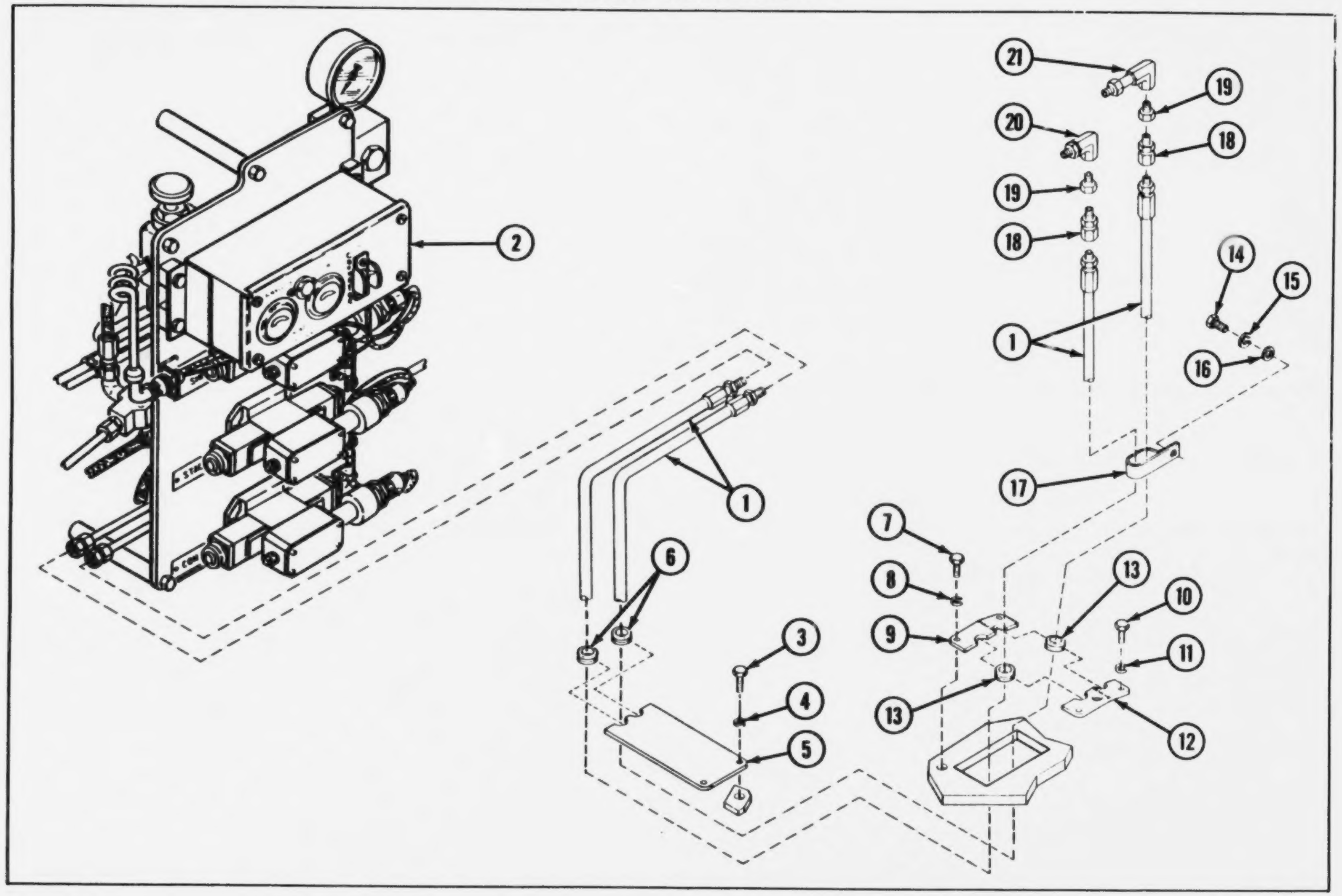
U Install reducers (10 and 11) and connect tubes (8 and 9) to reducers (10 and 11).

V Install nipples (6 and 7) on tubes (8 and 9) and connect hoses (4 and 5) to nipples (6 and 7).

W Install two clamps (1) with four screws (2) and four new lockwashers (3).

TA313165

CONVEYOR HYDRAULIC HOSES AND FITTINGS: REMOVAL AND INSTALLATION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TA313166

WARNINGS

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

Do not perform removal procedures until backup hydraulic gage has been checked visually. Gage must show 0 psi.

CAUTION

Cap hydraulic lines and ports immediately after disconnecting lines, to avoid entry of contaminants into system.

REMOVAL

A Disconnect two hose assemblies (1) from hydraulic control panel (2).

B Remove two screws (3), two lockwashers (4), plate (5) and two grommets (6) from crew compartment floor. Discard lockwashers.

C Remove two screws (7), two lockwashers (8) and plate (9) from crew compartment floor. Discard lockwashers.

D Remove two screws (10), two lockwashers (11), plate (12) and two grommets (13) from crew compartment floor. Discard lockwashers.

E Remove one screw (14), one lockwasher (15), one flat washer (16) and strap (17). Discard lockwasher.

F Disconnect hose assemblies (1) from two adapters (18) and remove from vehicle.

G Remove two adapters (18) from two bushings (19).

H Remove two bushings (19) from elbows (20 and 21).

I Remove elbows (20 and 21) from hydraulic motor.

INSTALLATION

A Install elbows (20 and 21) in hydraulic motor.

B Install two bushings (19) in elbows (20 and 21).

C Install two adapters (18) in two bushings (19).

D Connect hose assemblies (1) to two adapters (18).

E Install strap (17) to secure hose assemblies to conveyor pedestal, with one screw (14), one new lockwasher (15) and one flat washer (16).

F Position two grommets (13) and plates (9 and 12) where hose assemblies (1) pass through crew compartment floor. Secure plate (9) with two screws (7) and two new lockwashers (8). Secure plate (12) with two screws (10) and two new lockwashers (11).

G Position plate (5) and two grommets (6) where hose assemblies pass through crew compartment floor and secure plate with two screws (3) and two new lockwashers (4).

H Install two tube assemblies (1) on hydraulic control panel (2).

TA313167

Section VIII AUXILIARY POWER UNIT (APU) COMPARTMENT

COMPARTMENT HYDRAULIC HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION

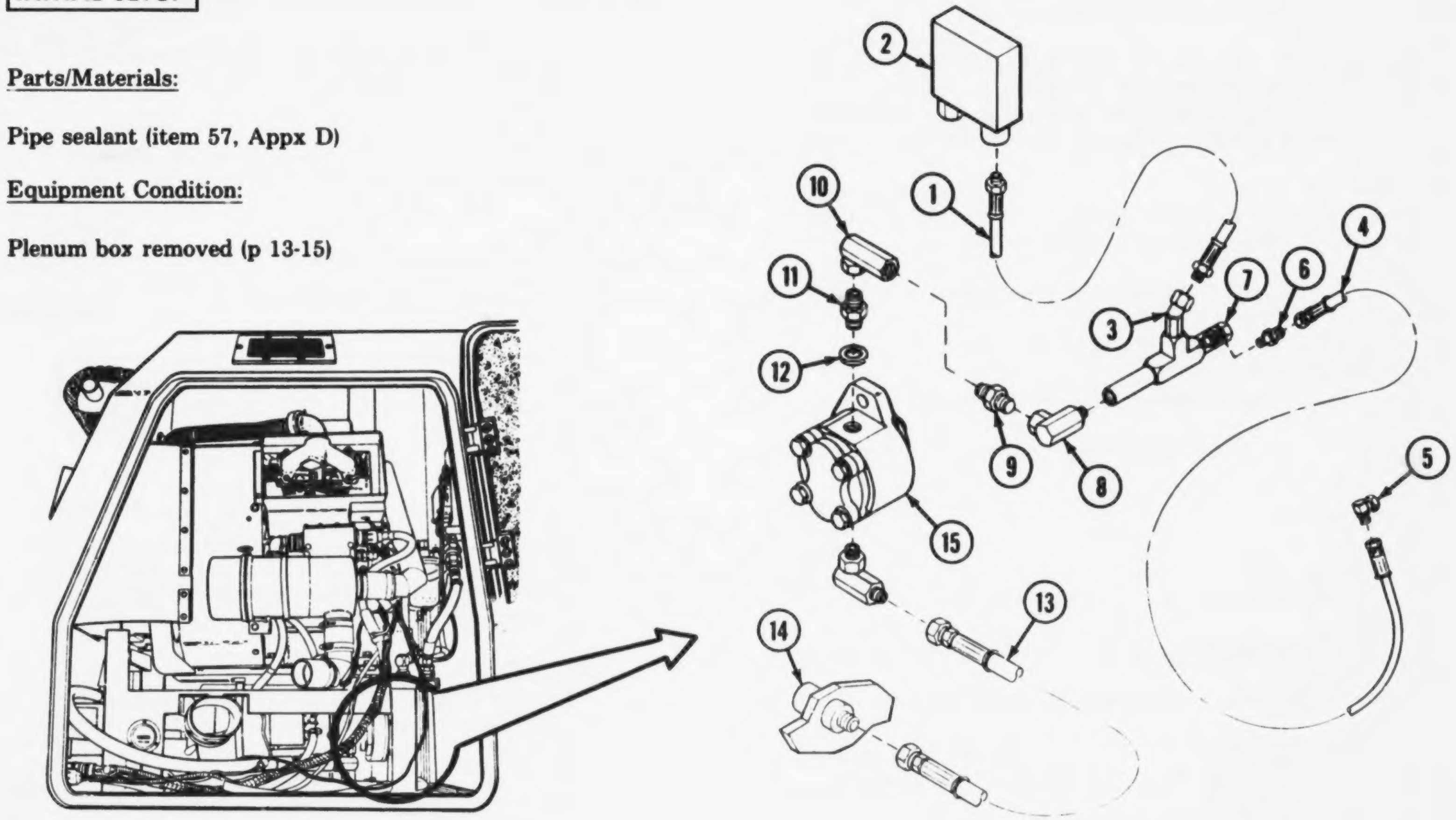
INITIAL SETUP

Parts/Materials:

Pipe sealant (item 57, Appx D)

Equipment Condition:

Plenum box removed (p 13-15)



TA58100

COMPARTMENT HYDRAULIC HOSES AND ASSOCIATED CONNECTING PARTS: REMOVAL AND INSTALLATION (CONTINUED)

WARNING

Make sure all systems are shut down and MASTER switch is OFF. Hydraulic fluid may be HOT.

CAUTION

Hydraulic lines and ports should be capped after disconnecting lines to avoid entry of contaminants into system.

REMOVAL

A Disconnect hose (1) from pressure switch (2) and elbow (3).

B Disconnect hose (4) from elbow (5) and adapter (6).

C Remove elbow (5) from APU wall coupling.

D Remove adapter (6) from valve (7).

NOTE

APU must be removed to perform steps E through I (see p 13-1).

E Remove elbow (8) from nipple (9).

F Remove nipple (9) from elbow (10).

G Remove elbow (10) from adapter (11).

H Remove preformed packing (12). Discard packing.

I Disconnect hose (13) from APU bulkhead nipple (14) and adapter (15).

INSTALLATION

A Apply pipe sealant (item 57, Appx D) to all male pipe threads.

B Connect hose (13) to APU bulkhead nipple (14) and adapter (15).

C Install new preformed packing (12).

D Install elbow (10) on adapter (11).

E Install nipple (9) on elbow (10).

F Install elbow (8) on nipple (9).

G Install adapter (6) on valve (7).

H Install elbow (5) in APU wall coupling.

I Connect hose (4) to elbow (5) and adapter (6).

J Connect hose (1) to pressure switch (2) and elbow (3).

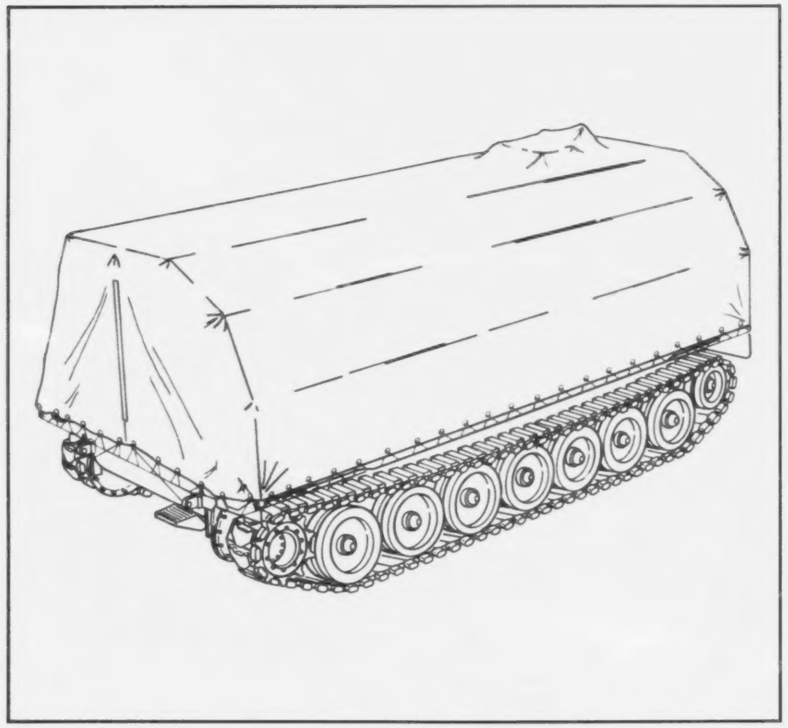
TA58090 ■

CHAPTER 17
DEPROCESSING AND COMBAT LOADING OF VEHICLE

Section I DEPROCESSING THE VEHICLE

GENERAL

This section illustrates and describes removal of the vehicle closure kit, padding from the extending points, basic issue item boxes, tape and hull bottom ventilation screens.



CLOSURE KIT: STORAGE AND REMOVAL

A Loosen side ropes (two on each side).

B Remove tie-down ropes at rear of vehicle.

C Remove corner ropes at rear of vehicle.

D Untie front corner ropes.

E Remove vehicle front ropes.

F Unlace ropes from front eyelets.

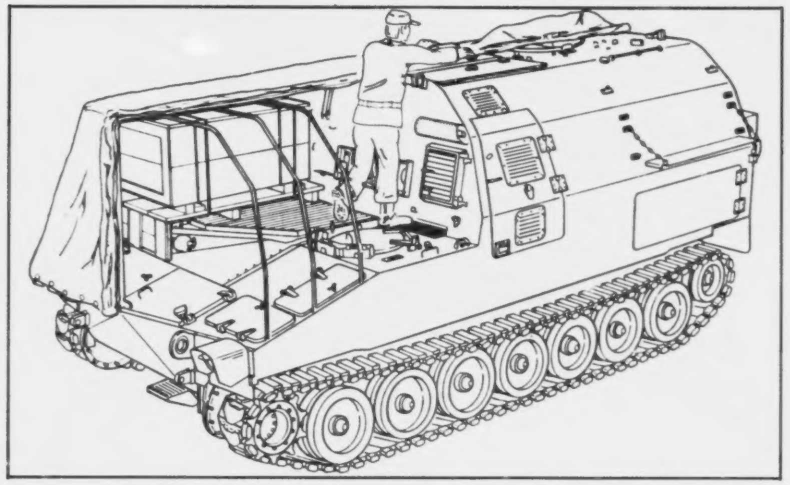
G Unlace ropes from eyelets on front corners.

H Remove guide ropes from side wire struts.

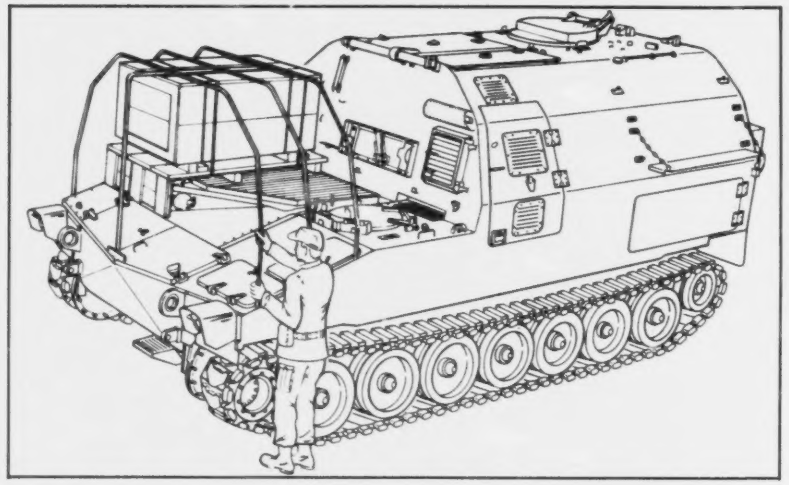
I Remove all ropes from eyelets.

TA310391

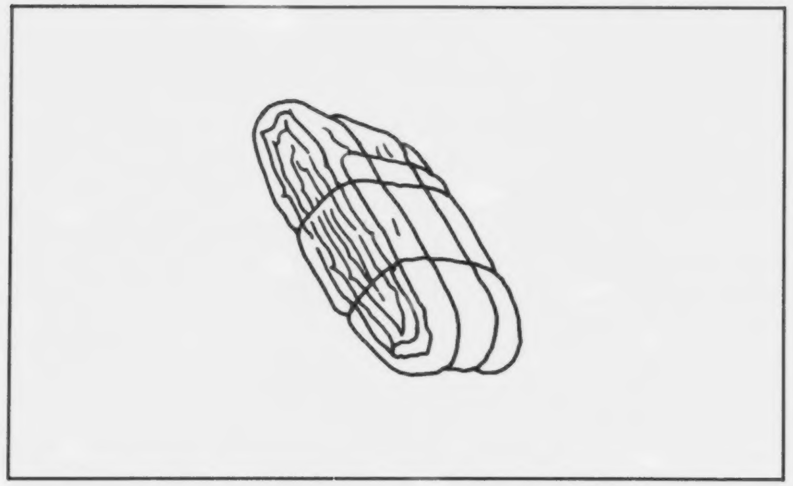
CLOSURE KIT: STORAGE AND REMOVAL (CONTINUED)



J Fold cover on sides to center point of frame assembly, and remove.



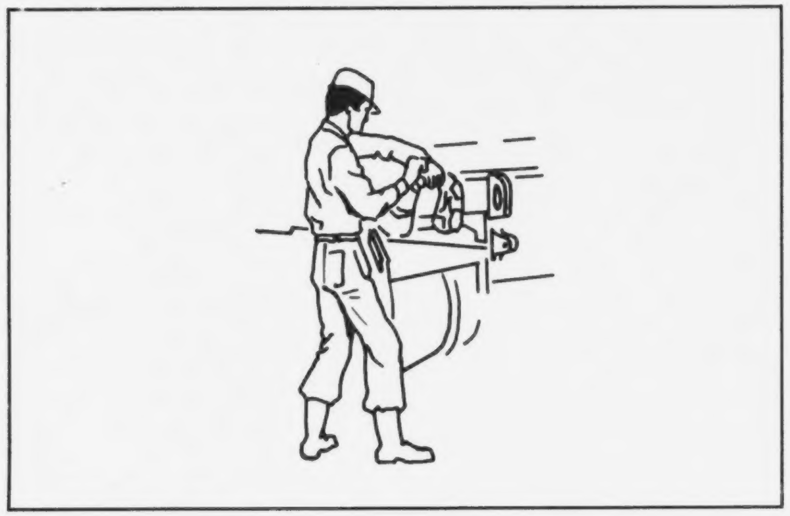
K Remove frame assembly.



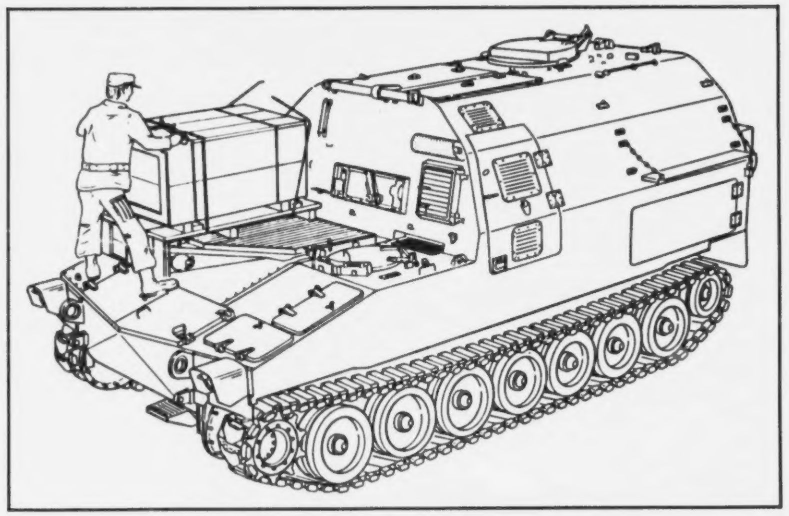
L Fold vehicle covers and stow in cab right stowage basket.

TA310392

PADDING, BASIC ISSUE ITEM BOXES: REMOVAL

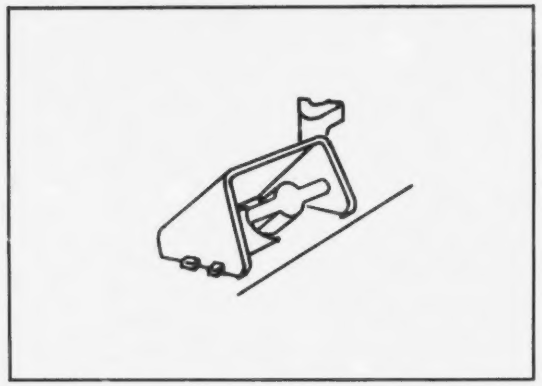


A Remove padding from extending points.

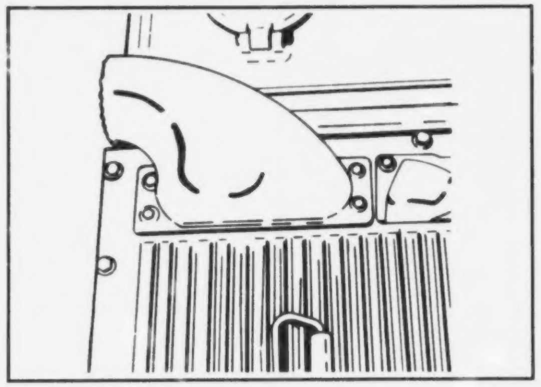


B Remove basic issue item boxes from hull compartment.

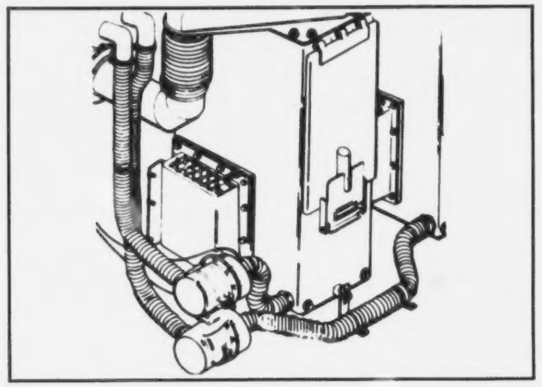
TAPE: REMOVAL



A Remove tape from fire extinguisher bracket.



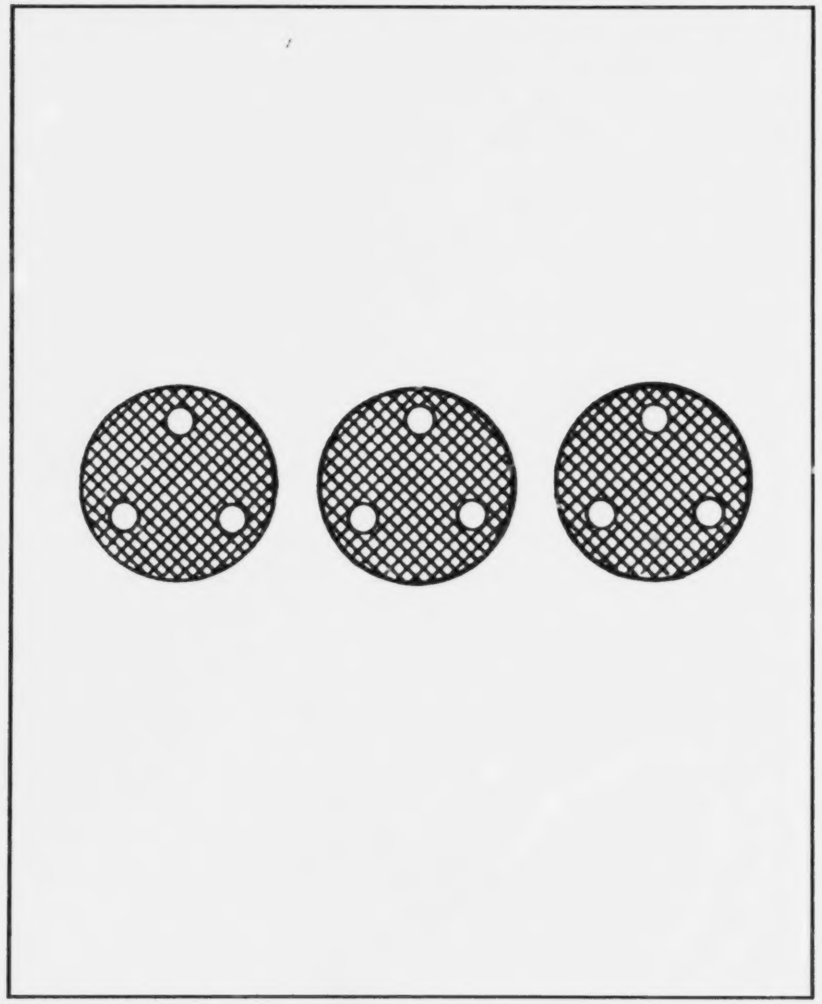
B Remove tape from engine exhaust outlet.



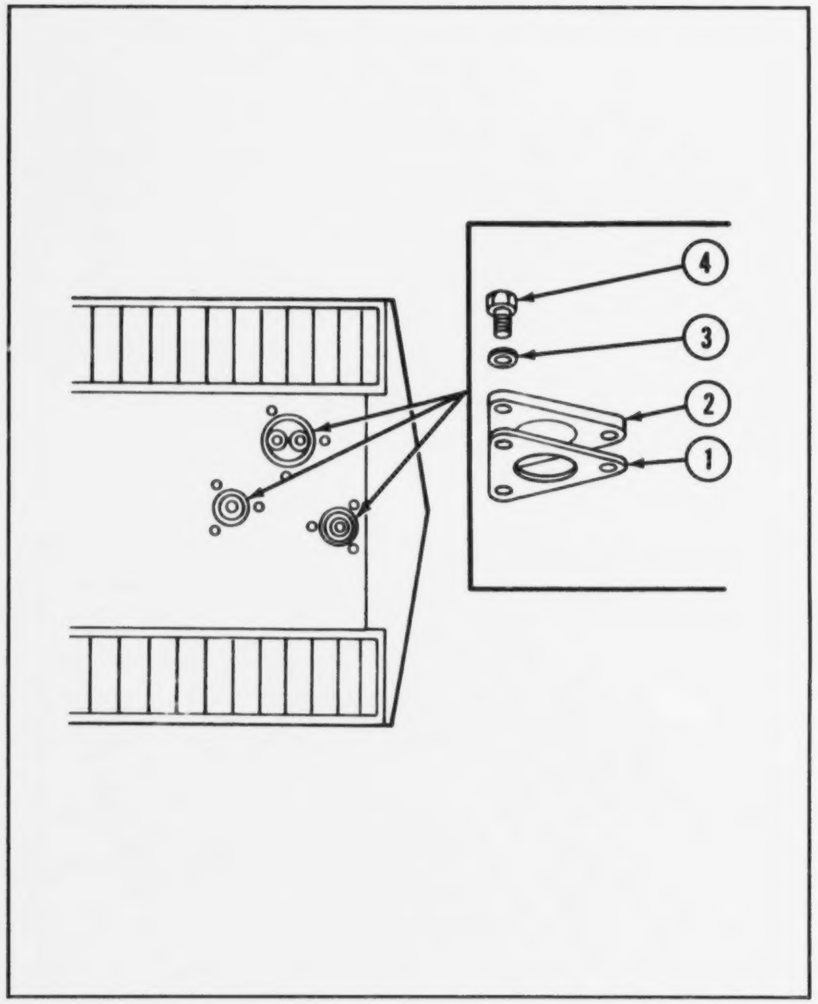
C Remove sealing tape from air cleaner inlet in crew compartment.

TA310393

VENTILATION SCREEN REMOVAL AND ACCESS COVER INSTALLATION



A Remove three screens from bottom of hull.



B To install access covers, place gasket (1) on hull, and place cover (2) on gasket. Install washer (3) and screw (4).

TA310394

Section II DEPROCESSING OF BASIC ISSUE ITEMS COMBAT LOADING OF VEHICLE

GENERAL

The deprocessing of basic issue items and combat loading should be accomplished with crew present.

DEPROCESSING BASIC ISSUE ITEMS

Open all large containers and inventory contents with packing slip furnished. Record each item missing. Compare contents with TM 9-2350-267-10 Basic Issue Item List to make sure all items are present.

Install fire control equipment as is. No cleaning is required.

Clean all other tools and equipment.

As required, store all basic issue items in their respective vehicle storage facilities as indicated in TM 9-2350-267-10.

COMBAT LOADING

Combat loading of the vehicle is primarily a crew responsibility and should be done as described in TM 9-2350-267-10.

TA310395

CHAPTER 18
SHIPMENT, LIMITED STORAGE AND DESTRUCTION TO PREVENT ENEMY USE

Section I SHIPMENT AND STORAGE

SHIPPING INSTRUCTIONS

Preparation for Shipment. When shipping M992 Carrier, Ammunition, Tracked, the officer in charge of preparing the shipment will be responsible for furnishing the materiel in serviceable condition, properly cleaned, processed, packaged and packed.

REMOVAL OF PRESERVATIVES PRIOR TO SHIPMENT

Personnel removing vehicle from storage for shipment must not remove preservatives other than to make sure materiel is complete and serviceable. If preservatives have been removed, they must be restored to a prescribed level of preservation prior to shipment.

ARMY SHIPPING DOCUMENTS

Prepare all Army shipping documents in accordance with AR 55-355.

LIMITED STORAGE INSTRUCTIONS

When received for storage and already processed for domestic shipment by manufacturer, as indicated on DD Form 1397, vehicle will not be reprocessed unless inspection performed on receipt of materiel reveals corrosion, deterioration, etc.

Upon receipt from manufacturing facilities, if processing data on tag indicates that preservation has been rendered ineffective by operation or by freight shipping damage, completely process vehicle in accordance with MIL-H-46709.

Vehicle to be prepared for administrative storage must be given limited technical inspection and processed as prescribed on DD Form 1397. The results of the inspection and classification will be entered on DA Form 2404.

RECEIVING INSPECTION

Immediately upon receipt of vehicle for storage, it must be inspected and serviced as prescribed. Perform systematic inspection. Replace or repair all missing or broken parts. If repairs are beyond scope of unit, and materiel will be inactive for an appreciable length of time, place materiel in limited storage and attach tags specifying repairs needed. The report of these conditions will be submitted by the unit commander for action by an ordnance maintenance unit.

TA310397

SHIPMENT AND STORAGE (CONTINUED)

When materiel is inactive for a limited time (not to exceed 90 days), process in accordance with TM 740-90-1.

Prepare DD Form 6 for all shipments received in damaged or otherwise unsatisfactory condition due to deficiencies in preservation, packaging, marking, handling, loading, or storage, and for apparently excessive preservation.

Preferred storage site for vehicle is in dry covered sheds. When it is necessary to store materiel outdoors, protect it against the elements as prescribed in SB 740-1 and TM 743-200.

INSPECTION DURING STORAGE

Perform visual inspection periodically to determine general condition. If corrosion is found, remove it and clean, paint and treat vehicle with prescribed preservatives.

NOTE

Touch-up painting will be in accordance with TM 43-0139.

REMOVAL FROM LIMITED STORAGE

If vehicle is not shipped or issued upon expiration of limited storage period, process as applicable in accordance with MIL-H-46709.

If vehicle to be shipped will reach its destination within limited storage period, it need not be reprocessed when removed from storage, unless necessary because of anticipated in-transit weather conditions.

When vehicle is to be placed into service, immediately deprocess in accordance with instructions on DD Form 1397.

LOADING

CAUTION

Height and width of vehicle, when prepared for rail transportation, must not exceed limitations prescribed for particular railroad lines. Whenever possible, local transportation officers must be consulted about limitations of particular railroad lines to be used for movement in order to avoid delays, dangerous conditions or damage to equipment.

When vehicle is shipped by rail, every precaution must be taken to see that it is properly loaded, blocked and securely fastened to flatcar floor.

Inspect flatcar prior to loading. Make sure it is in suitable condition to carry loads safely.

SHIPMENT AND STORAGE (CONTINUED)

Prepare flatcar for loading by removing debris, previous blocking, nails and other obstructions. Inspect flatcar for loose or broken floor planks. If found unsatisfactory, reject car for use.

If suitable hoisting equipment, permanent loading ramps and handling equipment are not available for loading or unloading materiel, improvised runways, ramps and spanning platforms can be constructed.

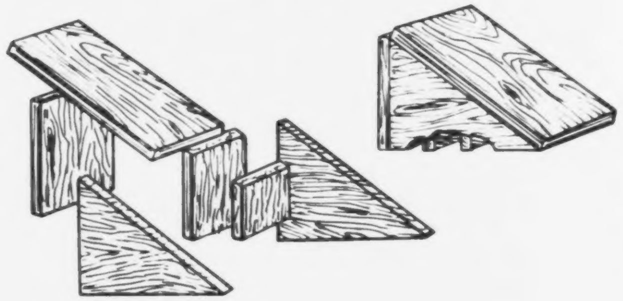
Loading must be governed by the capacity and length of flatcars available at time of shipment, as well as requirements of bills of lading and shipping instructions.

Position vehicle as far from brake wheel end of flatcar as space permits. Provide minimum clearance of 4 inches below and 6 inches above, behind, and to each side of flatcar brake wheel.

BLOCKING

General. All blocking instructions specified herein are minimum and are in accordance with the Association of American Railroads Pamphlet, Section No. 6 (Rules Governing the Loading of Department of Defense Materiel on Open-Top Cars). Additional blocking may be added at discretion of officer in charge.

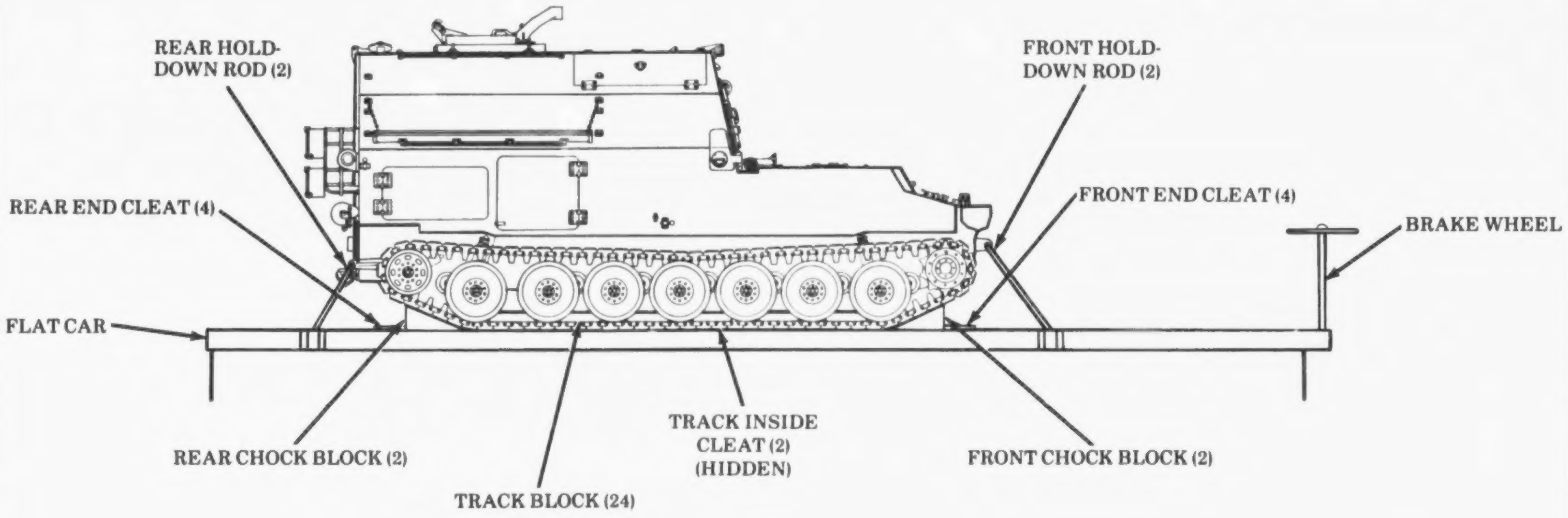
CHOCK BLOCK. Construct four chock blocks: two to fit angle between tracks and car deck at front of vehicle, and two to fit angle between track and car deck at rear of vehicle. Using 1-5/8-inch-thick lumber, make chock blocks 12 inches wide and minimum of 18 inches high. Nail pieces together with 20-penny nails. Place one chock block against front of each track, and one against rear of each track. Toenail chock blocks to car floor with 40-penny nails.



CHOCK BLOCK – EXPLODED AND ASSEMBLED VIEWS

TA310399

SHIPMENT AND STORAGE (CONTINUED)


REAR HOLD-DOWN ROD (2)
FRONT HOLD-DOWN ROD (2)
REAR END CLEAT (4)
FRONT END CLEAT (4)
BRAKE WHEEL
FLAT CAR
TRACK INSIDE CLEAT (2) (HIDDEN)
REAR CHOCK BLOCK (2)
FRONT CHOCK BLOCK (2)
TRACK BLOCK (24)

END CLEATS. Place one cleat (2 x 4 x 12 inches, eight required) against end of each chock block and secure to car deck with 30-penny nails. Place upper cleat on top of lower cleat and secure to lower cleat with 30-penny nails.

TRACK INSIDE CLEATS. Place cleats (6 in. x 6 in. x 14 ft, two required) along inside of left and right tracks. Nail to car floor with 30-penny nails, staggered approximately every 12 inches.

SIDE CLEATS. Locate one cleat (2 x 3 x 10 inches, eight required) against inside and outside of each chock block. Secure each to car deck with 20-penny nails.

TRACK BLOCKS. Cut blocks (34 required) to conform with shape of roadwheels. Locate blocks on tracks between wheels. Place wedges under block to ensure snug fit against wheels, if required. Nail 2 in. x 4 in. cleat (length to suit) across top blocks to prevent track blocks from sliding out of position.

HOLD-DOWN RODS. Thread both ends of rod (1-1/4-inch diameter, length to suit). Insert one end of rod through lifting eye on front of vehicle. Bend rod and insert other end through stake pocket on opposite side of flatcar. Repeat operation with second rod and lifting eye on front of vehicle. Repeat operations with two rods on rear of vehicle.

TA310400

Section II DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

Destruction of vehicle, armament and equipment when subject to capture or abandonment in a combat zone, will be undertaken only when unit commander decides such action is necessary.

Read TM 750-244-6 for information on destruction of all mechanical equipment. In general, destruction of essential parts, followed by burning, will usually be sufficient to render vehicle, armament and equipment useless. Time is usually critical.

Materiel must be damaged so that it cannot be restored to usable condition by either repair or cannibalization. If lack of time or personnel prevents destruction of all parts, give priority to destruction of parts hardest to replace. It is important the same parts be destroyed on all units to prevent construction of one complete unit from several damaged ones.

TA310401

APPENDIX A REFERENCES

GENERAL

The following is a listing of publications applicable to Organizational Maintenance for materiel covered in this technical manual. Appropriate indexes should be consulted frequently for latest applicable changes, revisions and additions.

REGULATIONS

AR 310-25	Dictionary of United States Army Terms
AR 310-50	Authorized Abbreviations and Brevity Codes
AR 385-40	Accident Reporting and Records
AR 385-55	Prevention of Motor Vehicle Accidents
AR 55-355	Military Traffic Management Regulation
AR 746-1	Packaging of Army Materiel for Shipment and Storage
AR 75-1	Malfunctions Involving Ammunition and Explosives

MANUALS

DA PAM 738-750	The Army Maintenance Management System (TAMMS)
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
FM 5-25	Explosives and Demolition
TM 10-277	Chemical, Toxicological and Missile Fuel Handlers Protective Clothing
TM 11-5830-340-12	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Intercommunication Set AN/VIC-1(V)
TM 11-6625-366-15	Operator's, Organizational, DS, GS and Depot Maintenance Manual: Multimeter TS-352 B/U
FM 3-5	Nuclear, Biological and Chemical (NBC) Decontamination
TM 38-230-1	Packaging of Materiel: Preservation (VOL I)
TM 38-230-2	Packaging of Materiel: Packing (VOL II)
TM 43-0139	Painting Instructions for Field Use
TM 5-4210-218-13&P	Halon 1301 Recharging System
TM 750-116	Organizational, Direct Support and General Support Maintenance Procedures for Purging and Charging of Fire Control Instruments
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use
TM 9-1005-213-10	Operator's Manual: Machine Gun, .50-cal. Browning, M2, Heavy Barrel, Flexible
TM 9-1005-213-25	Organizational, DS, GS and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Machine Gun, .50-cal. Browning, M2, Heavy Barrel, Flexible

TA58075

TM 9-1005-245-14	Operator, Organizational, DS and GS Maintenance Manual Including Repair Parts and Special Tool Lists (Including Depot Maintenance Repair Parts and Special Tools): Various Machine Gun Mounts and Combinations Used on Tactical and Armored Vehicles
TM 9-2350-267-10	Operator's Manual: Carrier, Ammunition, Tracked: M992 (2350-01-110-4660)
TM 9-2350-267-20P	Organizational Maintenance Repair Parts and Special Tool List: For Hull, Powerpack, Drive Controls, Tracks, Suspension and Associated Components: Carrier, Ammunition, Tracked: M992/(2350-01-110-4660)
TM 9-2530-200-24	Organizational, Direct Support and General Support Maintenance Manual: Standards for Inspection and Classification of Tracks, Track Components and Solid-Rubber Tires (FSC 2530)
TM 9-6140-200-14	Operator and Organizational Maintenance Manual for Lead-Acid Storage Batteries
TM 3-6665-225-12	Operator's and Organizational Maintenance Manual: Alarm, Chemical Agent, Automatic, Portable
TM 9-2540-205-24&P	Personnel Heater Maintenance

BULLETINS

SB 740-1	Storage and Supply Activities: Covered and Open Storage
SB 740-98-1	Storage Serviceability Standard: Tracked Vehicle, Wheeled Vehicles and Component Parts
TB SIG 222	Solder and Soldering
TB 43-0210	Nonaeronautical Equipment Army Oil Analysis Program (AOAP)
TB 750-651	Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems

LUBRICATION ORDER

LO 9-2350-267-12	Carrier, Ammunition, Tracked: M992 (2350-01-110-4660)

TA58065

APPENDIX B
MAINTENANCE ALLOCATION CHART
Section I INTRODUCTION

GENERAL

This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

INSPECT. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).

TEST. To verify serviceability by measuring the mechanical, pneumatic, hydraulic or electrical characteristics of an item and comparing those characteristics with prescribed standards.

SERVICE. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontamination, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

ADJUST. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

ALINE. To adjust specified variable elements of an item to bring about optimum or desired performance.

CALIBRATE. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

REMOVE/INSTALL. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

REPLACE. To remove an unserviceable item and install a serviceable counterpart, in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

REPAIR. The application of maintenance services, including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

TA313168

OVERHAUL. That maintenance effort (service/action) required to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

REBUILD. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc) considered in classifying Army equipment/components.

EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

COLUMN 1, GROUP NUMBER. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

COLUMN 2, COMPONENT/ASSEMBLY. Column 2 contains the name of components, assemblies, subassemblies, and modules for which maintenance is authorized.

COLUMN 3, MAINTENANCE FUNCTIONS. Column 3 lists the functions to be performed on the item listed in column 2.

COLUMN 4, MAINTENANCE CATEGORY. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C	Operator or crew
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

COLUMN 5, TOOLS AND EQUIPMENT. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

COLUMN 6, REMARKS. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

COLUMN 1, REFERENCE CODE. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

COLUMN 2, MAINTENANCE CATEGORY. The lowest level of maintenance authorized to use the tool or test equipment.

COLUMN 3, NOMENCLATURE. Name or identification of the tool or test equipment.

COLUMN 4, NATIONAL STOCK NUMBER. The national stock number of the tool or test equipment.

TA313169

COLUMN 5, TOOL NUMBER. The manufacturer's part number.

EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

COLUMN 1, REFERENCE CODE. The code recorded in Column 6, Section II.

COLUMN 2, REMARKS. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

TA313170

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
01	ENGINE								
0100	Powerpack	Inspect		0.5					
		Test		0.4				23, 24, 25	
		Service		0.8				26, 27, 28	
		Install		9.0					
	Engine	Inspect		0.5					
		Test		0.2				30	
		Service	1.0						
		Adjust		3.0					
		Replace			8.0			29, 32	
		Repair			20.5				
		Overhaul				48.0	**		
	Mount, Engine	Inspect			0.1				
		Replace			1.0			31	
		Repair			2.0				

* The subcolumns are as follows:
Operator/crew
Organizational
Direct support
General support
Depot
Indicates WT/MH required.
** Work times are included in DMWR.

TA57306

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
01	ENGINE — Continued								
0101	Head, Cylinder	Inspect		1.2					
		Replace			2.8				
		Repair		1.0	2.3				
		Overhaul			4.2				
0102	Damper, Vibration	Inspect		0.1	0.5				
		Replace			0.5				
0103	Flywheel	Inspect			0.5				
		Replace			0.5				
		Repair			1.0				
0105	Valves	Inspect			0.4				
		Adjust			1.0				
		Replace			1.0				
		Repair			1.0				
0106	Filter, Oil	Inspect		0.1					
		Service		0.1					
		Replace		0.2					
		Repair			0.3				
	Core, Oil Cooler	Inspect		0.2					
		Replace			1.1				

TA310922

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
01	ENGINE — Continued								
0106	Lines and Fittings (Oil, External)	Inspect	0.3						
		Replace		0.3					
0109	Manifold, Exhaust	Inspect			0.2				
		Replace			2.0				
03	FUEL SYSTEM								
0301	Injector, Fuel	Inspect			0.2				
		Test			0.2				
		Adjust			0.1				
		Replace			0.2				
		Repair			0.7				
		Overhaul				1.0			
0302	Pump, Fuel (Fuel Tanks, Left/Right)	Inspect		0.2					
		Test		0.2					
		Replace		0.2					
		Repair			1.0				
		Overhaul				1.5			
	Valve, Relief	Service		1.0					
	Pump, Fuel, Electrical Engine Auxiliary	Inspect		0.2					
		Test		0.2					
		Replace		0.09					
		Repair			0.10				

TA310923

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
03	FUEL SYSTEM — Continued								
0304	Air Cleaner (Dry)	Inspect	0.1						
		Service	0.1						
		Replace		1.0					
		Repair		1.0					
	Fan, Centrifugal (Blower Motor)	Inspect		0.1					
		Replace		1.0					
		Repair							
	Filter	Inspect	0.1						
		Service	0.3						
		Replace		0.2					
	Ducts	Inspect		0.3					
		Replace		1.0					
		Repair		1.5					
	Hoses	Inspect		0.2					
		Replace		1.0					
	Motor, Dust Exhauster	Test		0.2					
		Replace		0.5					
		Repair			1.5				
0305	Blower, Intake, Engine	Inspect			0.1				
		Replace			0.4				
		Repair				2.0			
	Shaft, Blower Drive	Inspect			0.2				
		Replace			0.5				

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
03	FUEL SYSTEM – Continued								
0305	Turbocharger	Inspect			0.2				
		Replace			0.3				
		Repair				2.9			
		Overhaul				6.0	**		
	Duct, Air	Inspect		0.1					
		Replace		0.2					
		Repair		0.2					
0306	Tank, Fuel	Inspect	0.2						
		Service	0.3						
		Replace			10.0				
		Repair			6.0				
	Heat Shield	Replace		1.0					
		Repair		2.0					
	Lines and Fittings	Inspect	0.3						
		Replace		2.0					
	Fuel System, Air Purge Pump	Test		0.1					
		Replace		2.0					
0308	Governor, Engine	Inspect			0.2				
		Test			0.1				
		Service			0.1				
		Adjust			0.2				
		Replace			0.3				
		Repair			0.3	2.6			

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Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
03	FUEL SYSTEM — Continued								
0309	Element and Gasket, Fuel Strainer (Primary)	Replace		0.2					
	Element and Gasket, Fuel Filter (Secondary)	Replace		0.2					
	Filter, Fuel (Primary and Secondary)	Inspect	0.1						
		Service	0.2						
		Replace		0.3					
0311	Heater, Engine Air Box	Inspect		0.2					
		Test		0.3					
		Replace			2.0				
		Repair				3.0			
0312	Controls and Linkage, Accelerator and Throttle	Inspect	0.2						
		Service		0.2					
		Adjust		0.2					
		Replace		2.0					
		Repair		1.0					
04	EXHAUST SYSTEM								
0401	Pipe, Exhaust	Inspect	0.2						
		Replace		0.5					

TA310926

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
05	COOLING SYSTEM								
0501	Radiator	Inspect	0.2						
		Service	0.1					34	
		Replace		1.5					
		Repair			1.0				
		Overhaul				8.0			
	Surge Tank	Inspect	0.2						
		Replace		0.3					
		Repair			0.5				
0502	Cowling, Deflectors Air Ducts, Shroud	Inspect	0.2						
		Replace		2.2					
		Repair			0.5				
0503	Water, Manifolds, Headers, Thermostats, and Housing Gaskets	Inspect	0.1						
		Remove/Replace			0.3				
		Repair			0.4				
	Thermostats	Inspect		0.1					
		Replace		0.5				36, 37	
	Hoses and Pipes	Inspect	0.2						
		Replace		0.4					
	Detector, Aeration	Inspect		0.1					
		Replace		0.3					

TA57309

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
05	COOLING SYSTEM —Continued								
0504	Pump, Coolant	Inspect	0.1						
		Replace		1.0					
		Repair			1.5				
0505	Fan Drive Assembly	Inspect			0.2				
		Service	0.1						
		Replace			3.5				
		Repair			3.0				
0505	Housing, Fan Drive	Inspect	0.1						
		Replace			0.3				
		Repair			0.3				
06	ELECTRICAL SYSTEM								
0601	Generator/Alternator	Inspect		0.3					
		Test		0.2					
		Replace		1.0					
		Repair			0.3				
		Overhaul				2.4			
0602	Generator/Regulator (Voltage)	Test		1.0					
		Adjust		1.0					
		Replace		0.3					

TA310928

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0602	Rectifier, Conduction-Cooled	Inspect		0.3					
		Test		0.3					
		Replace		0.5					
		Repair			1.0				
0603	Starting Motor	Inspect		0.2					
		Test		0.5					
		Replace		1.0					
		Repair			2.0				
		Overhaul			3.0				
	Solenoid, Starter	Inspect		0.1					
		Test		0.5					
		Replace		0.5					
		Repair			0.3				
	Drive, Clutch, Starter	Replace		0.2					
		Repair			0.3				
0607	**Instrument Control Panels and Accessory Panel Assemblies**	**Inspect**	0.1						
		Test		**0.3**					
		Replace		**2.0**					
		Repair		**0.6**					

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Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0607	Accessory Control Box Assembly	Remove/replace		0.04					
	Circuit Breaker Panel	Remove/replace		0.05					
	Circuit Breaker Panel - Hull	Remove/replace		0.05					
0607	Gages	Inspect Test Replace	0.1	 0.3 1.0					
	Lights	Inspect Test Replace	0.1	 0.2 0.2					
	Switches	Inspect Test Replace	0.1	 0.2 0.5					
0607	APU Voltage Regulator	Inspect Remove/replace	0.01	 0.08					
	Ventilation Blower Reset Relay	Inspect Remove/replace	0.01	 0.05					
	Panel Assembly, Gage	Inspect Remove/replace Repair	0.02	 0.08 0.15					

TA310930

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0607	NBC Power Control Box	Inspect	0.03						
		Remove/replace		0.10					
		Repair		0.17					
	Stacker Control Box Assembly	Inspect	0.01						
		Remove/replace		0.1					
		Repair		0.04					
0608	Relay, Starter	Inspect		0.1					
		Test		0.2					
		Replace		0.2					
	Relay, Master	Inspect		0.1					
		Test		0.2					
		Replace		0.2					
		Repair			1.0				
	APU Control Box	Remove/replace		0.22					
	Switch; Upper Rear Door Lower Control, and Rear Door Upper Control	Inspect	0.01						
		Remove/replace		0.1					
	Conveyor Control Switch	Inspect	0.1						
		Remove/replace		0.2					

TA310931

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0608	Telephone and NBC Terminals	Inspect	0.1						
		Remove/replace		0.1					
0609	Lights—APU High Air Temperature and Low Oil Pressure Indicator	Inspect	0.1						
		Test		0.2					
		Replace		0.2					
		Repair		0.2					
0610	Switches, Warning	Test		0.2					
		Replace		0.3					
	Units, Sending	Inspect		0.1					
		Test		0.2					
		Replace		0.5					
0612	Battery, Storage (Wet or Dry)	Inspect	0.1						
		Test		0.2					
		Service	0.1	0.2					
		Replace		1.0					
		Repair			1.0				
	Cable, Battery	Inspect	0.1						
		Test		0.2					
		Service	0.1	0.2					
		Replace		0.6					
		Repair		0.3					

TA310932

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0613	Wiring Harness, Hull	Inspect	0.3						
		Test		2.0					
		Replace			15.0				
		Repair		12.0					
	Wiring Harness, Engine	Inspect		0.2					
		Test		1.0					
		Replace		2.0					
		Repair		2.0					
	Rectifier-to-Regulator Wiring Harness	Inspect		0.1					
		Remove/replace		0.5					
		Repair		1.0					
	NATO Intervehicle Slave Connector Electrical Lead	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					
	Gage Panel Wiring Harness	Inspect	0.1						
		Remove/replace		0.2					
		Repair			0.7				
	Cable Assembly Passive Night Viewer	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					
	NATO Intervehicular Power Receptacle Assembly	Inspect	0.2						
		Remove/replace		0.1					

TA310933

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0613	Driver's Compartment Wiring Harness	Inspect		0.2					
		Remove/replace		0.6					
		Repair		2.0					
	Battery-to-Bulkhead Electrical Lead	Inspect		0.1					
		Remove/repair		1.5					
	Bulkhead-to-APU Voltage Regulator Harness	Inspect		0.1					
		Remove/replace		0.5					
		Repair		1.5					
	Cargo Compartment Wiring Harness (12330257)	Inspect		0.5					
		Remove/replace		1.0					
		Repair			2.0				
	Cargo Compartment Wiring Harness	Inspect		1.0					
		Remove/replace				12.0			
		Repair				15.0			
	Front and Rear Inter-vehicular Slave Lead	Inspect	0.08						
		Remove/replace		0.5					
		Repair		1.0					
	NBC Power Wiring Harness	Inspect		0.1					
		Remove/replace		0.5					
		Repair			0.7				
	NBC System Ground Lead	Inspect		0.1					
		Remove/replace		0.1					

TA310934

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0613	NBC Wiring Harness-to-NBC Air Purifier and Assembly	Inspect		0.05					
		Remove/replace		0.2					
	Conveyor Wiring Harness	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.2					
	Stacker Control Switch Cable Assembly	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					
	Wiring Harness, Stacker Solenoid to Stacker Disconnect	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.3					
	Wiring Harness, Accessory Control Box	Inspect	0.2						
		Remove/replace		0.1					
		Repair			0.2				
	Accessory Control Box Power Lead	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.2					
	APU Control Box-to-APU Voltage Regulator Wiring Harness	Inspect		0.1					
		Remove/replace		0.4					
		Repair		2.0					

TA310935

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0613	Intervehicular Ground Cable	Inspect		0.1					
		Remove/replace		0.1					
		Repair		0.3					
	Hull Lighting, Accessory Control Box, Personnel Heater, Air Cleaner Wiring Harness	Inspect		0.1					
		Remove/replace		0.8					
		Repair		0.7					
	Telephone Wiring Harness	Inspect	0.1						
		Remove/replace		0.2					
		Repair		0.1					
	Trailer Receptacle Wiring Harness	Inspect		0.1					
		Remove/replace		0.1					
		Repair		1.5					
	Chemical Agent Detector Wiring Harness	Inspect	0.1						
		Remove/replace		0.2					
	STE/ICE, Hull Wiring Harness	Inspect	3.0						
		Remove/replace		0.3					
		Repair			0.1				
	STE/ICE, Engine Wiring Harness	Inspect	3.1						
		Remove/replace		0.2					
		Repair			0.1				

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
0613	STE/ICE Wiring Harness DCA to Bulkhead	Inspect		0.1					
		Remove/replace		0.5					
		Repair			0.1				
	STE/ICE Wiring Harness Bulkhead To Engine	Inspect		0.1					
		Remove/replace		0.1					
		Repair		0.1					
	STE/ICE Wiring Harness, Engine to Disconnect	Inspect		0.1					
		Remove/replace		0.1					
		Repair		0.1					
	STE/ICE Current Shunt	Inspect	0.1						
		Remove/replace		0.1					
	STE/ICE Transducers	Inspect	4.0						
		Remove/replace		0.3					
	STE/ICE Pulse Tachometer	Inspect	0.1						
		Remove/replace		0.1					
	SCEA Cable Assembly	Remove/replace		0.1					
		Repair			0.2				
	OFSA Cable Assembly	Remove/replace		0.1					
		Repair			0.1				
	AFES Engine Cable Assembly	Remove/replace		0.1					
		Repair			0.8				

TA57311

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL SYSTEM —Continued								
	AFES Fire Extinguisher Cable Assembly	Remove/replace		0.5					
		Repair		0.4					
	AFES Fire Extinguisher Wiring Harness	Remove/Replace		0.5					
		Repair		0.4					
0616	Blower, Ventilating	Test		0.2					
		Replace		0.5					
		Repair			1.0				
07	TRANSMISSION								
0705	Gear Shift, Vacuum Booster and Controls	Inspect	0.2						
		Service	0.2						
		Adjust		0.2					
		Replace		3.6					
		Repair		2.0					
0710	Transmission Assembly, Cross-drive	Inspect	0.2						
		Test		0.3				2	
		Service	0.2						
		Adjust		0.2					
		Replace			5.0			32	
		Repair			9.0				
		Overhaul				46.0	**		
0721	Filter, Oil	Service		0.1					
		Replace		0.1					

TA57313

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
08	TRANSFER FINAL DRIVE ASSEMBLY								
0801	Power Input Transfer Assembly	Inspect	0.1						
		Replace			1.0				
		Repair			2.0				
		Overhaul				3.0	••		
	Joint Assembly, Universal	Inspect	0.1						
		Service	0.1						
		Replace		1.0					
		Repair		1.2					
	Drive Assembly, Final	Inspect	0.1						
		Service	0.1						
		Replace		2.5					
		Repair			5.0	2.0		1, 3, 4, 5	
		Overhaul				4.0	••		
12	BRAKES								
1201	Parking Brakes	Inspect	0.1						
		Adjust		0.2					
		Replace		1.5					
		Repair		1.0					
1206	Mechanical Brake System								

TA57314

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Service Brake Controls and Linkage	Inspect	0.2						
		Service	0.2						
		Adjust		0.5				38, 37, 40	
		Replace		1.0					
		Repair		1.0					

TA57315

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
13	WHEELS AND TRACKS								
1301	Arm and Hub Assembly, Roadwheel	Inspect	0.1					9,16,17,19,	
		Service	0.2					20,21,22	
		Replace		1.0				10	
		Repair		0.7	2.0				
		Overhaul				2.1			
	Disc Assembly, Roadwheel	Inspect	0.1						
		Replace		0.5					
		Rebuild					**		
	Anchor, Torsion Bar	Replace		1.0					
1301	Torsion Bar	Inspect	0.2						
		Replace		1.0				6, 14, 18	
1303	Arm Assembly, Compensating Idler	Inspect	0.1						
		Service	0.2						
		Replace		2.0					
		Repair		1.7	3.0				
	Idler Wheel	Inspect	0.1						
		Replace		1.0					
	Link Compensating, Track Adjusting	Inspect	0.1						
		Adjust	0.3						
		Replace		1.5					
		Repair		1.0					
1304	Track, Drive Sprockets	Inspect	0.2						
		Replace		2.0				11, 12	

TA310940

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
13	WHEELS AND TRACKS —Continued								
1305	Track Assembly	Inspect	1.0						
		Adjust	1.0						
		Replace		4.0				7, 8	
		Repair		1.5					
	Track Shoe Vehicular	Replace		1.0					
		Repair		0.5					
		Rebuild					**		
14	STEERING								
1401	Mechanical Steering Gear Assembly	Inspect	0.3						
		Service	0.2						
		Adjust		0.2					
		Replace		2.0					
		Repair		2.0					
15	FRAME, TOWING ATTACHMENTS, AND DRAWBARS								
1503	Pintle Assembly, Towing	Inspect	0.1						
		Service	0.1						
		Replace		0.5					
		Repair		0.5					
	Towing Hooks	Service	0.3						
		Replace		0.2					
		Repair		0.2					

TA310941

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
16	SPRINGS AND SHOCK ABSORBERS								
1604	Shock Absorber Equipment	Inspect	0.1						
		Replace		1.0				15	
		Repair		0.3					
18	BODY AND HULL								
1801	Hull Assemblies								
	Top Doors	Remove/replace		0.27					
		Repair		0.23					
	Top Door Hinge Assy	Inspect	0.02						
		Remove/Replace		0.1					
		Repair		0.1					
	Crank, Hand	Inspect	0.01						
		Remove/replace		0.1					
		Repair		0.1					
	Canister Door, Right Side	Inspect	0.02						
		Remove/replace		0.20					
		Repair		1.6					
	Canister Door Latch Assembly Right Side	Inspect	0.02						
		Remove/replace		0.3					
		Repair		0.4					

TA57316

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Canister Door, Left Side	Inspect	0.02						
		Remove/replace		0.20					
		Repair		1.6					
	Canister Door Latch Assembly Left Side	Inspect	0.02						
		Remove/Replace		0.3					
		Repair		0.4					
	Rear Door, Upper	Inspect	0.02						
		Remove/replace		0.46					
		Repair		0.24					
	Rear Door, Lower	Inspect	0.02						
		Remove/replace		0.3					
		Repair		0.7					
	Personnel Door	Inspect	0.02						
		Remove/replace		0.5					
		Repair		0.7					
	Personnel Door Latch	Inspect	0.02	0.3					
		Remove/replace		0.7					
		Repair							

TA57317

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
18	BODY AND HULL —CONTINUED								
1801	APU Compartment Side Door	Inspect	0.1						
		Remove/replace		0.2					
		Repair		0.1					
	APU Compartment Front Door	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.2					
	APU Compartment Access Plate	Inspect	0.1						
		Remove/replace		0.1					
	APU Compartment Louvered Grille	Inspect	0.1						
		Remove/replace		0.4					
	Fuel Inlet Door	Inspect	0.1						
		Remove/replace		0.2					
	Fuel Filter Cover Plate	Inspect	0.1						
		Remove/replace		0.1					
	Upper Rear Door Manual	Inspect	0.1						
		Remove/replace		3.0					
	Covers, Plates, and Doors	Inspect	0.5						
		Replace		2.0					
		Repair		2.0					
	Projectile Rack Base	Inspect	0.1						
		Remove/replace		1.8					
	APU Compartment Winterization Duct Cap	Inspect	0.1						
		Remove/replace		0.7					

TA57318

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
18	BODY AND HULL —Continued								
1801	APU Compartment Soundproof Panels	Inspect	0.1						
		Remove/replace		0.2					
	Floor Access Cover and Drain Plug	Inspect	0.1						
		Remove/replace		0.1					
	Wiring Harness Guards	Inspect	0.1						
		Remove/replace		0.1					
	Commander's Cupola and Cover Assembly	Inspect		0.5					
		Remove/replace			0.4				
		Repair			0.2				
1802	Fenders	Inspect	0.2						
		Replace		1.0					
		Repair		1.0					
1803	Driver's Hatch	Inspect	0.5						
		Service	0.2						
		Replace		1.0					
		Repair		0.1					
	Cover Assembly	Inspect	0.5						
		Remove/replace		0.3					
		Repair		0.1					
	Driver's Hatch Latch Assembly	Inspect	0.2						
		Remove/replace		0.1					
		Repair		0.1					

TA310944

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
18	BODY AND HULL —Continued								
1806	Upholstery, Seats and Carpets								
	Commander's Seat	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					
	Driver's Seat	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					
	Crew Seating	Inspect	0.1						
		Remove/replace		0.3					
		Repair		0.1					
	Fatigue Mats, Crew Compartment	Inspect	0.1						
		Remove/replace	0.1						
1808	Stowage Boxes, Brackets, and Straps	Inspect	0.5						
		Service	0.2						
		Replace		2.0					
		Repair		2.5					
	Duffle Bag Stowage Nets	Inspect	0.1						
		Remove/replace	0.1						
		Repair			0.4				

TA57319

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Light Holders	Inspect Remove/replace	0.1	 0.1					
	Right and Left Stowage Nets	Inspect Remove/replace	0.1	 0.1					

TA57320

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
18	BODY AND HULL —Continued								
1808	Duffle Bag Stowage Shelves	Inspect Remove/replace	0.1	 0.1					
	Rifle Stowage Pads and Clips	Inspect Remove/replace	0.1	 0.1					
	Periscope Stowage Box	Inspect Remove/replace	0.1	 0.1					
	Night Vision Goggles Bracket	Inspect Remove/replace	0.1	 0.1					
	Web Straps	Inspect Remove/replace	0.1	 0.1					
	Crowbar Stop	Inspect Remove/replace	0.1	 0.1					
	Pioneer Kit Bracket	Inspect Remove/replace Repair	0.1	 0.1 0.1					
	Box, Vehicular	Inspect Remove/replace Repair	0.1	 0.1 0.1					
	Fire Extinguisher Stowage/Lower Rear Door/APU Compartment Bulkhead	Inspect Remove/replace	0.1	 0.1					

TA310946

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
18	BODY AND HULL —Continued								
1808	Basket, Stowage, Vehicular	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					
	Left Hand Front Canister Compartment	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.2					
	Right Hand Front Canister Compartment	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.2					
	Right Hand Rear Canister Compartment	Inspect	0.1						
		Remove/repair		0.1					
		Repair		0.2					
	Ammunition Rack Restraints, Bulkhead Mounted	Inspect	0.1						
		Remove/replace		0.1					
	Nine-Round Gang Locking Racks	Inspect	0.1						
		Remove/replace		0.4					
		Repair			0.1				
		Test			0.1				
	Ammunition Rack, Restraints, Rack Mounted	Inspect	0.1						
		Remove/replace		0.2					
		Repair			0.1				
		Test			0.1				

TA57323

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
18	BODY AND HULL —Continued								
1808	Ammunition Rack Boxes, Stowage	Inspect	0.2						
		Remove/replace		0.3					
22	BODY, CHASSIS OR HULL AND ASSOCIATED ITEMS								
2201	Conveyor Shroud	Inspect	0.04						
		Repair			0.3				
		Remove/replace	0.2						
2202	Heating and Ventilating Duct	Inspect	0.03						
		Remove/replace		0.7					
		Repair		0.3					
2205	Bilge Pump	Inspect		0.2					
		Replace		0.5					
		Repair			1.0				
2207	Personnel Heater Bases and Ducts	Inspect	0.2						
		Test		0.2					
		Service		0.2					
		Adjust		0.2					
		Replace		2.0					
		Repair		0.5	3.0				

TA57324

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
22	BODY, CHASSIS, OR HULL, AND ASSOCIATED ITEMS —Continued								
	Heater Outlet Tee Assembly	Inspect	0.2						
		Remove/replace		0.2					
		Repair		0.2					
2210	Data Plates	Inspect	0.2						
		Remove/replace		0.1					
24	HYDRAULIC LIFT COMPONENTS								
2400	Major Assemblage								
	Conveyor Supports	Inspect	0.1						
		Remove/replace		0.1					
	Conveyor Support Cable	Inspect	0.1						
		Remove/replace		0.1					
	Conveyor Stowage Strap	Inspect	0.1						
		Remove/replace		0.1					
	End Section	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.1					

TA57325

Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Support Stand	Inspect	0.1						
		Remove/replace		0.3					
		Repair		0.1					
	Conveyor Springs	Inspect	0.01						
		Remove/replace		0.1					

TA57326

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
24	HYDRAULIC LIFT COMPONENTS—Continued								
2400	Conveyor Assembly	Inspect	0.10						
		Remove/replace		0.6					
		Repair		0.4					
	Conveyor Subassembly	Inspect	0.1						
		Remove/replace		0.8					
		Repair		0.1					
	Chain Assembly	Inspect	0.1						
		Adjust	0.1						
		Remove/replace		0.4					
		Repair	0.2						
	Conveyor Center Section	Inspect	0.1						
		Remove/replace		0.4					
		Repair		0.1					
	Conveyor Drive Section	Inspect	0.1						
		Remove/replace		1.0					
		Repair		0.3					
	Drive Section Roller Assembly	Inspect	0.1						
		Remove/replace		0.2					
		Repair		0.3					

TA310950

Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
24	HYDRAULIC LIFT COMPONENTS—Continued								
2400	Conveyor Takeup End Section	Inspect	0.1						
		Remove/replace		0.7					
		Repair		0.2					
	Takeup End Section Roller Assembly	Inspect	0.1						
		Remove/replace		0.2					
		Repair		0.3					
	Stacker Assembly								
	Stacker Bar Assembly	Inspect	0.1						
		Remove/replace		0.5					
		Repair		0.1					
	Stacker Assembly	Inspect	0.1						
		Remove/replace		0.2					
		Repair		0.1					
	Stacker Carrier, Slider	Inspect	0.1						
		Adjust		0.1					
		Remove/replace		0.4					
		Repair		0.5					
	Stacker Support Assembly	Inspect	0.1						
		Remove/replace		0.3					
		Repair		0.5					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
24	HYDRAULIC LIFT COMPONENTS—Continued								
2400	Stacker Manual Winch Assembly	Inspect	0.1						
		Remove/replace		0.2					
		Repair		0.2					
	Stacker Chain Assembly	Inspect	0.1						
		Adjust	0.1						
		Remove/replace		0.2					
		Repair	0.1						
	Stacker Foot Brake	Inspect	0.1						
		Remove/replace		0.4					
		Repair		0.4					
	Hydraulic Reservoir Assembly	Inspect	0.3						
		Remove/replace		0.3					
		Repair	0.1						
	Conveyor Hydraulic Motor	Inspect		0.1					
		Remove/replace		0.1					
		Rebuild				0.6			
	Stacker Hydraulic Motor	Inspect	0.1						
		Remove/replace		0.3					
		Rebuild			0.6				
2401	Hydraulic Pump								
	APU Hydraulic Pump and Hardware	Inspect		0.1					
		Remove/replace		0.3					

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Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
24	HYDRAULIC LIFT COMPONENTS—Continued								
2401	Stacker Hydraulic Brake	Inspect Remove/replace Repair	0.1	 0.5	 0.2				
2406	Clutch Support and Pump Assembly	Inspect Remove/replace Repair Adjust		0.4 0.4 0.5 0.1					
	Backup Hydraulic System Clutch	Inspect Remove/replace Repair		0.1 0.5	 0.3				
	Backup Hydraulic Tubes and Hoses	Inspect Remove/replace		0.3 0.3					
	Backup Hydraulic Hand Pump Assembly	Inspect Remove/replace Repair	0.1	 0.2 0.1					
	Primary Hydraulic System Hose and Fitting	Inspect Remove/replace		0.1 0.3					
	Hydraulic Suction and Return Tubing, Hose, and Fittings	Inspect Remove/replace	0.1	 0.1					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
24	HYDRAULIC LIFT COMPONENTS—Continued								
2406	Hydraulic Panel Assembly	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.3					
	Hydraulic Reservoir Associated Parts	Inspect	0.3						
		Remove/replace		0.3					
		Repair		0.1					
	Conveyor Hydraulic Hoses, Tubing, and Fitting	Inspect		0.1					
		Remove/replace		0.4					
	Upper Rear Door Actuator Tubes and Fittings	Inspect	0.1						
		Remove/replace		0.3					
	Upper Rear Door Hydraulic Actuator	Inspect	0.2						
		Remove/replace		0.6					
		Repair			0.3				
	Stacker Hydraulic Hoses, Tubing and Fittings	Inspect	0.1						
		Remove/replace		0.3					
	Backup Hydraulic System Hoses and Fittings	Inspect	0.1						
		Remove/replace		0.3					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
29	**AUXILIARY GENERATOR AND ENGINE AND CONTROLS**								
2901	**Auxiliary Power Unit Assembly**	**Inspect**		0.5					
		Test		1.5					
		Service		1.5					
		Replace		1.2					
		Repair		20.0					
		Overhaul				40.0			
	APU Support Stand	**Inspect**		0.1					
		Remove/replace		0.1					
	APU Support Assembly	**Inspect**	0.2						
		Remove/replace		0.1					
	APU Hour Meter	**Inspect**	0.2						
		Remove/replace		0.1					
	Engine Assembly, Diesel	**Replace**			2.0				
		Repair			24.0				
		Overhaul					30.0		
2910	**APU, Oil Drain Lines**								
	Filter, Oil	**Inspect**		0.1					
		Service		0.5					
		Replace		0.2					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
29	AUXILIARY GENERATOR AND ENGINE AND CONTROLS—Continued								
2919	APU, Driving Mechanism								
	APU Chain Cover	Inspect			0.1				
		Remove/replace			0.3				
	APU Gear Case	Inspect			0.1				
		Remove/replace			0.5				
2932	Pump Assembly, Fuel Injection	Inspect			0.2				
		Adjust			0.2				
		Replace			2.0				
		Repair			2.5				
	Nozzle and Holder Assembly, Fuel	Inspect			1.5				
		Replace			0.5				
		Repair			2.0				
2933	Engine Air Cleaner Hoses and Brackets	Inspect	0.1						
		Service	0.1						
		Replace		0.1					
		Repair		0.1					
2933	Adapter and Heater Assembly	Inspect			0.5				
		Replace			2.0				
2936	Linkage, Governor	Adjust			0.5				
		Replace			1.8				

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Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
29	AUXILIARY GENERATOR AND ENGINE AND CONTROLS—Continued								
2937	Engine Fuel Filter	Inspect Service Replace	0.2 0.2	 0.2					
	Auxiliary Power Unit Fuel Filters	Inspect Service Replace	0.2 0.2	 0.2					
2938	Engine, Priming, Systems, Lines and Pumps	Inspect Remove/replace	0.3	 0.1					
2941	Engine Muffler, Exhaust and Tail Pipes	Inspect Remove/replace	0.3	 0.2					
2952	Engine Coupling Deflectors, Air Ducts, and Shroud	Inspect Remove/replace	0.1	 0.6					
	APU Panels	Inspect Remove/replace	0.2	 0.1					
2961	Generator/Starter (Combination)	Test Replace Repair Overhaul		0.3 0.2	 0.4		 7.0		

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
2963	Wiring, Electric, APU (12329650)	Inspect Remove/replace Repair		0.1 0.5 0.8					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
29	AUXILIARY GENERATOR AND ENGINE AND CONTROLS—Continued								
2963	Plunger Assembly, Fuel Shutoff Solenoid	Adjust			1.0				
		Replace			0.8				
		Repair			1.0				
	Wiring, Electric, APU (12329640)	Inspect		0.1					
		Remove/replace		0.7					
		Repair		1.0					
	Starter Relay	Remove/replace		0.1					
	Starter-To-Relay Cable Assembly	Inspect		0.1					
		Remove/replace		0.1					
	APU Hydraulic Pressure Switch	Remove/replace		0.2					
		Repair		0.2					
	APU Diode	Inspect		0.3					
		Remove/replace		0.4					
	High Air Temperature Switch Lead Assembly	Inspect	0.1						
		Remove/replace		0.1					
	Ground Lead Assembly	Inspect	0.1						
		Remove/replace		0.1					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
29	AUXILIARY GENERATOR AND ENGINE AND CONTROLS—Continued								
	Ground Lead, Generator Assembly	Inspect	0.1						
		Remove/replace		0.1					
	Hourmeter Wiring Harness	Inspect		0.3					
		Remove/replace		0.5					
33	SPECIAL PURPOSE KITS								
3301	Reusable Shipping Containers	Repair					**		
		Overhaul					**		
3303	Winterization Kit								
	Bulkhead to Coolant Control Box Wiring Harness	Inspect		0.1					
		Remove/replace		0.2					
		Repair		0.2					
	Battery Insulation Blanket	Inspect	0.1						
		Remove/replace	0.1	0.2					
	APU Front Door and Side Door Cover	Remove/replace		0.2					
	Heater Assembly, Co	Inspect	0.2						
		Remove/replace		0.3					
		Repair		0.3					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
3303	Control Assembly	Inspect Remove/replace Repair		0.1 0.2	 0.2				
3307	Special Purpose Kits	Remove/replace		0.1					
34	ARMAMENT								
3401	Machinegun, Cal.-0.50 M2 HB, Flexible	Service Adjust Repair Overhaul Rebuild		1.0 1.0 2.25	 3.5		 4.5		
4209	Signaling Devices	Inspect Remove/replace		0.1 0.1					

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Section II MAINTENANCE ALLOCATION CHART
FOR
CARRIER, AMMUNITION, TRACKED,
M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
34	ARMAMENT—Continued								
3401	Barrel Assembly	Adjust		0.7					
		Replace		1.0					
	Back Plate Assembly	Adjust		1.0					
		Replace		0.5					
		Repair			1.3				
	Rod, Driving Spring w/Spring Assembly	Adjust		1.0					
		Replace		1.3					
	Bolt Assembly	Service		1.0					
		Replace		1.2					
		Repair			1.5				
	Buffer Assembly, Body	Service		1.0					
		Replace		0.5					
		Repair			1.3				
	Buffer	Service		1.0					
		Repair			1.2				
	Barrel Extension Assembly	Service		1.0					
47	WEIGHING AND MEASURING DEVICES								
4701	Tachometer, Speedometer and Related Parts	Inspect	0.2						
		Test		0.5					
		Service		0.5					
		Replace		1.0					
		Repair		1.0					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
76	FIRE FIGHTING EQUIPMENT COMPONENTS								
7639	Fixed Fire Fighting Equipment (Vehicular)	Repair	0.1	0.1					
	Crew Test and Alarm Panels (T/A)	Remove/replace		0.1					**NOTE** A self test is installed in each system. If a fault or defect is present, a light will come on in the control box. This includes any breaks in the sensor wiring.
	Engine Test and Alarm Panels (T/A)	Remove/replace		0.1					
	HALON Extinguisher Bottles	Remove/replace		0.2					
	Optical Fire Sensing Assembly (OFSA)	Remove/replace		0.1					
	Lanyard Assembly	Remove/replace		0.4					
	Thermal Detector	Remove/replace		0.8					
	Standard Control Electronic Amplifier (SCEA)	Remove/replace		0.2					
	Remote Status Indicator (RSI)	Remove/replace		0.1					

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Section II MAINTENANCE ALLOCATION CHART FOR CARRIER, AMMUNITION, TRACKED, M992 — Continued

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
76	FIRE FIGHTING EQUIPMENT COMPONENTS—Continued								
	Lines and Tubes	Remove/replace		0.8					
91	NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC)								
9111	Collective Protective Equipment								
	Ventilated Facepiece System	Inspect	0.1						
		Remove/replace		0.3					
		Repair		0.1					
	Gas Particulate Filter Units	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.3					
9130	Warning and Detection Systems								
	M43 Chemical Agent Detector	Inspect	0.1						
		Remove/replace		0.1					
		Repair		0.3					
	M42 Alarm Unit	Test	0.1						
		Remove/replace		0.1					
		Repair		0.5					

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Section III TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
		TRANSMISSION		
1	O	BOLT, EYE: Used with sling, 5120-00-034-0875 to remove or install final drive assembly	5306-00-050-0347	MS51937-5 (96906)
2	O	GAGE, PRESSURE, DIAL INDICATING: To check engine and transmission oil pressure	4910-00-572-8612	8356176
3	O	PIN, GUIDE: To install final drive assembly	5120-00-034-0883	10914195
4	O	SLING, LIFTING, FINAL DRIVE: Used with eye bolt, 5306-00-050-0347 to remove or install final drive assembly	5120-00-034-0875	10914179
5	O	WRENCH, STRAP: To aline transmission output shaft and final drive input shaft	5120-00-357-9154	7676003 41-W-3382
		SUSPENSION		
6	O	ADAPTER, MECHANICAL PULLER: Used with puller, 5120-00-557-3615 to remove or install torsion bars	5120-00-322-5953	708370

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TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
7	O	FIXTURE, TRACK CONNECTING: To disconnect or connect track (with bar)	5120-00-605-3926	8741739
8	C	GAGE AND CASE ASSEMBLY: Roadwheel wear plate	4910-00-034-0874	10911904
9	C	GAGE, SPROCKET TOOTH: To check wear on sprocket teeth	5120-00-757-2745	10941458
10	C	GAGE, WEAR SPROCKET: To check wear on final drive sprocket	4910-00-908-7344	10954499
11	O,F	HANDLE REPLACER: Used with bearing cup and oil seal replacers	5120-00-034-0884	10914196
12	O	LIFTER, ROADWHEEL: To raise roadwheel	4910-00-912-4469	11593605
13	O	PULLER, END CONNECTOR, TRACK: To remove double pin track end connector	5120-00-918-0596	10955156
14	O	PULLER, SLIDE HAMMER-TYPE: Used with adapter, 5120-00-322-5953 to remove or install torsion bar	5120-00-557-3615	5573615
15	O	REPLACER, BEARING: To remove and replace shock absorber bearing	5120-00-084-7627	C-DTA-94390 10925993

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TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
16	O	REPLACER, BEARING CUP: Used with handle, 5120-00-034-0884 to replace roadwheel hub inner bearing cup	5120-00-034-0880	10914187
17	O,F	REPLACER, BEARING CUP: Used with handle, 5120-00-034-0884 to replace roadwheel hub outer bearing cup	5120-00-034-0885	10914197
18	F	REPLACER SEALS: Upper spindle arm support housing oil seal; used with 10914196 handle	5120-00-034-0878	10914185
19	F	REPLACER SEALS: Upper spindle arm retainer oil seal; used with 10914196	5120-00-034-0881	10914188
20	O,F	REPLACER SEALS: Wheel hub inner oil seal; used with 10914196	5120-00-034-0879	10914186
21	F	WRENCH, PRONG: Used on spindle arm support bearing adjusting nut	5120-00-034-0867	10914193
22	O	WRENCH, TORSION BAR RETAINING NUT: To remove or install torsion bar retaining nut	5120-00-708-3642	7083642

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TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
		POWERPACK		
23	O	ADAPTER, STRAIGHT, PIPE TO TUBE: Used with hose assembly, 4720-00-080-8586 to operate powerpack out of vehicle	4730-00-270-4607	5262058 (19207)
24	O	CABLE ASSEMBLY, GROUND: Powerpack-to-vehicle ground to operate powerpack out of vehicle	4910-00-084-0789	10913655
25	O	CABLE ASSEMBLY, POWER ELECTRICAL: Rectifier-to-generator (alternator) to operate powerpack out of vehicle	4910-00-930-8764	11605054
26	O	CABLE ASSEMBLY, POWER ELECTRICAL: Starter and master warning circuit to operate powerpack out of vehicle	2590-01-115-2276	12268162
27	O	COUPLING ASSEMBLY, QUICK-DISCONNECT: Used with hose assembly, 4720-00-080-8588 to operate powerpack out of vehicle	4730-00-738-8571	7388571
28	O	HOSE ASSEMBLY, NONMETALLIC: Used for fuel supply and fuel return to operate powerpack out of vehicle	4720-00-080-8588	8708306

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Section III TOOL AND TEST EQUIPMENT REQUIREMENTS — Continued

TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
28.1	O	SCREEN ASSEMBLY, PROTECTIVE: Used for fan protection during maintenance	4910-01-247-2976	12268262
29	O	SCREEN, SAFETY: Turbocharger inlet to operate powerpack out of vehicle	4910-00-981-2766	10930717
30	O	SLING, LIFTING, POWERPACK: To remove or install powerpack	4910-00-084-0790	10913779
31	F	SLING, ENGINE LIFTING: Used for lifting engine during and after separation of engine and transmission	4910-00-977-7398	10930560
32	O	STALL CHECK KIT: To stall check engine and/or transmission (powerpack removed from vehicle)	4910-00-757-1962	8351309
33	O	WRENCH, SOCKET: To remove or install powerpack mount support	5120-00-051-5567	11605662

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TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
		MISCELLANEOUS		
34	C,O	CLEANING TOOL, RADIATOR: To remove sand, oil and other debris from radiator cooler fins	2815-00-494-8257	11641959
35	O	GAGE: Brake adjusting	5120-00-733-5005	8351213 (19207)
36	O	HANDLE, INSTALLER: Used with installer, 5120-00-977-5579 to install thermostat housing seal	5120-00-977-5578	KM-J-7079-2 (33287)

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TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
37	O	INSTALLER, SEAL: Used with handle, 5120-00-977-5578 to install thermostat housing seal	5120-00-977-5579	KM-J-8550 (33887)
38	O	WRENCH, SPLINED BRAKE ADJUSTMENT: To check right brake adjustment	5120-00-733-8909	8351386
39	O	WRENCH, SPLINED BRAKE ADJUSTMENT: To check left brake adjustment	5120-00-733-8912	8351387
		APU		
40	O	SHOP EQUIPMENT, AUTOMOTIVE MAINTENANCE AND REPAIR: Organizational maintenance, common No. 1, less power	4910-00-754-0654	
41	O	SHOP EQUIPMENT, AUTOMOTIVE MAINTENANCE AND REPAIR: Organizational maintenance, common No. 2, less power	4910-00-754-0650	
42	F	SHOP EQUIPMENT, AUTOMOTIVE MAINTENANCE AND REPAIR: Field maintenance, basic, less power	4910-00-754-0705	

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Section III TOOL AND TEST EQUIPMENT REQUIREMENTS — Continued

TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
43	F	SHOP EQUIPMENT, FUEL AND ELECTRICAL MAINTENANCE AND REPAIR: Field maintenance	4910-00-754-0714	
		AUXILIARY POWER UNIT		
44	F	GAGE ALINEMENT: APU drive sprocket	5120-00-613-6779	11671961
45	F	PULLER, MECHANICAL: APU flywheel and sprocket	5120-00-613-6775	11671731
		ADDITIONAL TOOLS		
46	O	BIT, DRILL: 3/16 in.	5133-00-227-9654	
47	O	BLIND HAND RIVETER (KIT)	5120-00-017-2849	
48	O	BRUSH, WIRE	7920-00-291-5815	
49	O	DEEPWELL SOCKET	5120-00-235-5898	
50	O	DRILL, PORTABLE ELECTRIC: 1/4 in., 90 degree dr	5130-00-204-2728	
51	O	ELECTRICAL TOOL KIT: Automotive	5180-00-422-8594	

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TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
52	O	GENERAL MECHANICS TOOL KIT: Automotive	5180-00-177-7033	
53	O	PLIERS, SNAPRING	5120-00-789-0492	
54	O	PLIERS, WIRE, TWISTING	5120-00-542-4171	
55	O	PULLER, SHOCK ABSORBER	5120-00-084-7626	
56	O	RATCHET: 3/4 in. dr	5120-00-249-1076	
57	O	SCREW EXTRACTOR	5120-00-240-5221	
58	O	SLING, NYLON: 25 ft	3940-00-675-5003	
59	O	SOCKET: 3/4 in. dr, 1-1/8 in.	5120-00-239-0021	
60	O	SOCKET: 3/4 in. dr, 2 in.	5120-00-199-7770	
61	O	SOCKET, HEX KEY: 3/8 in.	5120-00-198-5390	
62	O	SOLDER IRON	3439-00-465-1649	
63	O	STUD REMOVER/SETTER	5120-00-596-0980	
64	O	TWIST DRILL: 1-1/4 in.	5133-00-227-9658	
65	O	WRENCH, ADJUSTABLE: 10 in.	5120-00-449-8083	
66	O	WRENCH, ADJUSTABLE: 12 in.	5120-00-264-3796	

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Section III TOOL AND TEST EQUIPMENT REQUIREMENTS — Continued

TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
67	O	WRENCH, ADJUSTABLE: 15 in.	5120-00-423-6728	
68	O	WRENCH, COMBINATION: 1-1/8 in.	5120-00-895-9577	
69	O	WRENCH, OPEN END: 1-1/2 in.	5120-00-277-2323	
70	O	WRENCH, OPEN END: 1-1/4 in.	5120-00-277-2322	
71	O	WRENCH, OPEN END: 1-1/8 in.	5180-00-187-7133	
72	O	WRENCH, PIPE: 10 in.	5120-00-227-1485	
73	O	WRENCH, PIPE: 18 in.	5120-00-277-1461	
74	O	WRENCH, TORQUE 1/2 in. dr, 0-175 lb-ft	5120-00-640-6364	
75	O	WRENCH, TORQUE: 3/4 in. dr, 0-600 lb-ft	5120-00-221-7983	
76	O	WRENCH, OPEN-END 1-3/16 in.	5120-00-555-9367	
77	O	WRENCH, OPEN END 1-3/8 in.	5120-00-184-8563	
78	O	PUNCH, DRIVE PIN, 1/16 in.	5120-00-240-6082	
79	O	WRENCH, OPEN END, 3/16 in.	5120-00-892-6089	

TA57336

TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or Test Equipment Number Reference Code	Maintenance Category	Item Name	National/NATO Stock Number	Tool Number
80	O	SLING, ENDLESS	3940-00-675-5002	
81	O	SHACKLE	4030-00-149-3514	

TA57337

Section IV REMARKS

REFERENCE CODE	REMARKS/NOTES

TA57343

APPENDIX C
TORQUE VALUES FOR THREADED FASTENERS

GENERAL

Follow torque values as specified in maintenance procedures throughout this manual. When no torque value is given, use the following guides. The guides are based on using clean, dry threads.

NOTE

Reduce torque by 10 percent when lubricating oil is used on threads (wet torque).

NOTE

Reduce torque by 20 percent when installing new threaded fasteners.

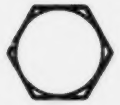
Reduce torque by 30 percent when threading screw into aluminum, unless inserts are used.

TA310405

STANDARD
TORQUE VALUE GUIDE (POUND-FEET)

SCREW DIAMETER	TORQUE LBS-FT A NO DASHES (SAE GRADE 2)	TORQUE LBS-FT B 3 DASHES (SAE GRADE 5)	TORQUE LBS-FT C 6 DASHES (SAE GRADE 8)	SOCKET SIZE
1/4 - 20 UNC	3 - 5	6 - 8	10 - 12	7/16
1/4 - 28 UNF	4 - 6	8 - 10	9 - 14	7/16
5/16 - 18 UNC	7 - 11	13 - 17	19 - 24	1/2
5/16 - 24 UNF	7 - 11	14 - 19	23 - 28	1/2
3/8 - 16 UNC	14 - 18	26 - 31	39 - 44	9/16
3/8 - 24 UNF	15 - 19	30 - 35	46 - 51	9/16
7/16 - 14 UNC	23 - 28	44 - 49	65 - 70	5/8
7/16 - 20 UNF	23 - 28	44 - 54	69 - 79	5/8
1/2 - 13 UNC	32 - 37	65 - 75	95 - 105	3/4
1/2 - 20 UNF	34 - 41	73 - 83	113 - 123	3/4
9/16 - 12 UNC	46 - 55	100 - 110	145 - 155	13/16
9/16 - 19 UNF	47 - 57	107 - 117	165 - 175	13/16
5/8 - 11 UNC	62 - 72	140 - 150	200 - 210	15/16
5/8 - 18 UNF	67 - 77	153 - 163	235 - 245	15/16
3/4 - 10 UNC	106 - 116	260 - 270	365 - 375	1-1/4
3/4 - 16 UNF	115 - 125	268 - 278	417 - 427	1-1/4
7/8 - 9 UNC	165 - 175	385 - 395	595 - 605	1-5/16
7/8 - 14 UNF	178 - 188	424 - 434	663 - 673	1-5/16
1 - 8 UNC	251 - 261	580 - 590	900 - 910	1-1/2
1 - 14 UNF	255 - 265	585 - 634	943 - 993	1-1/2
1-1/4 - 7 UNC	451 - 461	1070 - 1120	1767 - 1817	1-7/8
1-1/4 - 12 UNF	488 - 498	1211 - 1261	1963 - 2013	1-7/8
1-1/2 - 6 UNC	727 - 737	1899 - 1949	3111 - 3161	2-1/4
1-1/2 - 12 UNF	816 - 826	2144 - 2194	3506 - 3556	2-1/4

A



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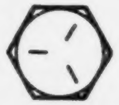

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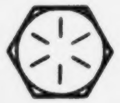
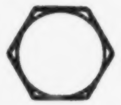
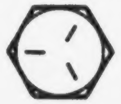
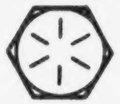


TA310406

METRIC
TORQUE VALUE GUIDE (NEWTON-METERS)

SCREW DIAMETER	TORQUE N-m A NO DASHES (SAE GRADE 2)	TORQUE N-m B 3 DASHES (SAE GRADE 5)	TORQUE N-m C 6 DASHES (SAE GRADE 8)	SOCKET SIZE
1/4 - 20 UNC	4 - 7	8 - 11	14 - 16	7/16
1/4 - 28 UNF	5 - 8	11 - 14	12 - 19	7/16
5/16 - 18 UNC	9 - 15	18 - 23	26 - 33	1/2
5/16 - 24 UNF	9 - 15	19 - 26	31 - 38	1/2
3/8 - 16 UNC	19 - 24	35 - 42	53 - 60	9/16
3/8 - 24 UNF	20 - 26	41 - 47	62 - 69	9/16
7/16 - 14 UNC	31 - 38	60 - 66	88 - 95	5/8
7/16 - 20 UNF	31 - 38	60 - 73	94 - 107	5/8
1/2 - 13 UNC	43 - 50	88 - 102	129 - 142	3/4
1/2 - 20 UNF	46 - 56	99 - 113	153 - 167	3/4
9/16 - 12 UNC	62 - 76	136 - 149	197 - 210	13/16
9/16 - 18 UNF	64 - 77	145 - 159	224 - 237	13/16
5/8 - 11 UNC	84 - 98	190 - 203	271 - 285	15/16
5/8 - 18 UNF	91 - 104	207 - 221	319 - 332	15/16
3/4 - 10 UNC	144 - 157	353 - 366	495 - 508	1-1/4
3/4 - 16 UNF	156 - 169	363 - 377	565 - 579	1-1/4
7/8 - 9 UNC	224 - 237	522 - 536	807 - 820	1-5/16
7/8 - 14 UNF	241 - 255	575 - 588	899 - 912	1-5/16
1 - 8 UNC	340 - 354	786 - 800	1220 - 1234	1-1/2
7/8 - 14 UNF	346 - 359	793 - 860	1279 - 1346	1-1/2
1-1/4 - 7 UNC	611 - 625	1451 - 1518	2396 - 2463	1-7/8
1-1/4 - 12 UNF	662 - 675	1642 - 1710	2661 - 2729	1-7/8
1-1/2 - 8 UNC	986 - 999	2575 - 2642	4218 - 4286	2-1/4
1-1/2 - 12 UNF	1106 - 1120	2907 - 2975	4753 - 4821	2-1/4
	A 	B 	C 	

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APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the M992. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts and Heraldic Items).

EXPLANATION OF COLUMNS

A Column (1) — Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material, eg "Use cleaning compound (item 5, Appx D)."

B Column (2) — Level. This column identifies the lowest level of maintenance that requires the listed items:

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

C Column (3) — National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

D Column (4) — Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

E Column (5) — Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by two-character alphabetical abbreviation (such as ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

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Section II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
1	0	8040-00-809-8252	ADHESIVE, MMM-A-121 (81348) 5-OZ TUBE	OZ
2	0	8040-00-290-4301	ADHESIVE, CEMENT, 1 QT MIL-A-5092 (81349)	EA
3	0	8040-00-664-4318	ADHESIVE, CEMENT, 1 PT MIL-A-5092 (81349)	EA
4	0	8040-00-664-4318	ADHESIVE, RUBBER, MMM-A-1617, TYPE II (80244)	EA
5	0	8040-00-148-7207	ADHESIVE, SEALANT, SILICON RTV, MIL-A-46106	OZ
6	0	8040-01-006-1685	ADHESIVE, TAN, SPECIAL PURPOSE, #V-45	OZ
7	0	6850-00-181-7929	ANTIFREEZE, PERM O-A-548, 1-GAL. CAN MIL-46153 (81349)	GL
8	0	6850-00-181-7933	ANTIFREEZE, PERM O-A-548, 1-GAL. CAN MIL-A-46153 (81349)	GL
9	0	6850-00-174-1806	ANTIFREEZE, ARCTIC-TYPE 55-GAL. DRUM MIL-A-11755 (81349)	DR
10	0	6850-00-598-7328	CLEANING COMPOUND, 2 CCMP CAN MIL-C-10597 (81349)	QT
11	0	6850-00-227-1887	CLEANING COMPOUND MIL-C-43454 (81349)	QT

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Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
12	0	6850-00-224-6665	CLEANING COMPOUND MIL-C-11090 (81349)	CN
13	0	6850-00-224-6657	CLEANING COMPOUND, RIFLE MIL-C-372 (81349)	CN
14	0	6850-00-224-6663	CLEANING COMPOUND, RIFLE MIL-C-372 (81349)	GL
15	0	5350-00-221-0872	CLOTH, ABRASIVE CROCUS .50 SHEETS PC458 (81348)	PG
16	0	7920-00-044-9281	CLOTH, CLEANING, LOW-LINT, MIL-C-85043	LB
17	0	8030-00-597-5367	COMPOUND, ANTISEIZE, MIL-A-907 (81349)	LB
18	0	6850-00-901-0591	DEICING-DEFROSTING COMPOUND 5-GAL. CAN MIL-A-8243 (81349)	CN
19	0	6850-00-281-1985	DRY-CLEANING SOLVENT PS-661 (02978)	GL
20	0	6850-00-281-3061	DRY-CLEANING SOLVENT, 4-OZ CAN PD-680 (81348)	DR
21	0		ENAMEL, FOREST GREEN, TYPE II, MIL-E-52798	QT
22	0	8010-00-527-2050	ENAMEL, GLOSS, BLACK, 1-GAL. CAN TTE-489 CLASS A (81348)	PT

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Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
23	0	8010-00-527-2053	ENAMEL, GLOSS, BLACK 1-QT CAN TTE-489 CLASS A (81348)	QT
24	0		ENAMEL, INSULATING, MIL-E-22118	PT
25	0	8010-00-664-7653	ENAMEL, SYN, GLOSS, WHITE TT-E-489 (81349)	QT
26	0	9110-00-391-7813	FUEL, JELLIED, ALCOHOL 2.625-OZ CAN 4006 (94745)	CN
27		9150-00-935-1017	GREASE, AUTOMOTIVE ART, 14-OZ CAN MIL-G-10924 (81349)	TY
28		9150-00-190-0904	GREASE, AUTOMOTIVE ART MIL-G-10924 BRAYCOTE610 (98308)	LB
29		9150-00-190-0905	GREASE, AUTOMOTIVE ART MIL-G-10924 BRAYCOTE610 (98308)	LB
30		9150-00-935-9808	HYDRAULIC FLUID, PET, OHT, MIL-H-6083 BRAYCO783C (98308)	GL
31		9150-00-935-9807	HYDRAULIC FLUID, PET, OHT, MIL-H-6083 BRAYC0783C (98308)	QT

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Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
32		6850-00-753-4967	INHIBITOR, CORROSION 0-I-00490B (81348)	OZ
33	0		LUBRICANT, DRY FILM, MIL-L-8937	TB
34	0	9150-00-231-6689	LUBRICATING OIL, GEN PURPOSE, PL, SPC VVL800 (8348)	QT
35		9150-00-189-6727	LUBRICATING OIL: MIL-L-2104B (81349)	QT
36		9150-00-188-9858	LUBRICATING OIL: MIL-L-2104B (81349)	CN
37		9150-00-186-6668	LUBRICATING OIL ENG: MIL-L-2104B (81349)	CN
38		9150-00-186-6681	LUBRICATING OIL ENG: MIL-L-2104B (81349)	QT
39		9150-00-231-9062	LUBRICATING OIL, GEN, 5-GAL. CAN VVL800 (81348)	GL
40		9150-00-231-2361	LUBRICATING OIL, GEN MIL-L-3150 (81349)	QT
41		9150-00-231-2356	LUBRICATING OIL, GEN MIL-L-3150 (81349)	CN

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Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
42		9150-00-402-2372	LUBRICATING OIL, OES, 5-GAL. CAN CONOCODN600 FLUID TYPE 1 (15445)	CN
43		9150-00-402-4478	LUBRICATION OIL, OES, 1-QT CAN CONOCODN600 FLUID (15445)	QT
44			PAINT, RUST INHIBITOR PRIMER, TT-P-659	QT
45		6640-00-285-4694	PAPER, LENS MNNP40 (81348)	HD
46			PASTE, ZINC CHROMATE, TT-P-1757, COMP E, COLOR Y	QT
47		9150-00-250-0926	PETROLATUM, TECHNICAL, 5-LB CAN VVP236 (81348)	LB
48		9150-00-250-0933	PETROLATUM, TECHNICAL, 5-LB CAN VVP236 (81348)	LB
49			PLASTIC PLASTISOL, TYPE I OR II, CLASS 2, COLOR BLACK, MIL-P-20689	PT
50		7920-00-205-1711	RAG, WIPING, DD-R-30 (81348)	LB
51			SEALER, TYPE I OR II, MIL-S-11030	PT

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Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
52		8030-00-823-7917	SEALING, COMPOUND, GRADE C, MIL-S-22473 (81349)	BT
53		8030-01-104-5392	SEALING, COMPOUND, TYPE II, GRADE N, MIL-S-46163	BT
54		8030-00-159-8176	SEALING, COMPOUND MIL-S-45180 (81349)	TU
55		8030-00-275-8115	SEALING, COMPOUND, SYNTHETIC GLASS, TYPE II, MIL-S-7124 (11030)	PT
56		8030-00-252-3391	SEALING, COMPOUND AGASKETNO2 (77247)	OZ
57			SEALING, COMPOUND, TEFLON PIPE SEALANT (AST) (BML64070)	TU
58		6850-00-880-7616	SILICON COMPOUND, DC-4	OZ
59		5970-00-926-7219	TAPE, INSULATION, ELECTRICAL HH-T-595 (81348)	RL
60			TAPE, INSULATION, ELECTRICAL MIL-I-7798A	RL
61			TAPE, PACKAGING, WATERPROOF PPP-T-60, TYPE 4	RL
62		8030-00-889-3535	TAPE, ANTISEIZE, TEFLON 1/2 IN. WD, PER MIL-T-27730	RL

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
63	O	8030-00-889-3535	TAPE, ANTISEIZE, SIZE I PER MIL-T-27730	RL
64	O	8010-00-242-2089	THINNER, PAINT MIXER TT-T-291GR1 (81348)	GL
65	O	8010-00-558-7026	THINNER, PAINT MINERAL TT-T-291 (81348)	CN
66	O	5610-00-141-7838	WALKWAY COMPOUND MIL-W-5044 TYPE 2 (81349)	GL
37	O	8010-01-160-6744	COATING, ALIPHATIC POLYURETHANE, CHEMICAL RESISTANT, BROWN MIL-C-46168	KT
68	O	8010-01-160-6741	COATING, ALIPHATIC POLYURETHANE, CHEMICAL RESISTANT, GREEN MIL-C-46168	KT
69	O	9150-00-543-7220	LUBRICATING OIL, MOLY-SIL DOD-L-25681	LB
70	O	3439-00-555-4629	SOLDER, TIN ALLOY	LB
71	O	8010-00-582-5318	PRIMER, COATING, TT-P-1757	
72	O	9150-00-702-7100	LUBRICANT, SOLID, WAX BASE NYLUBE 150 (07161)	LB

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

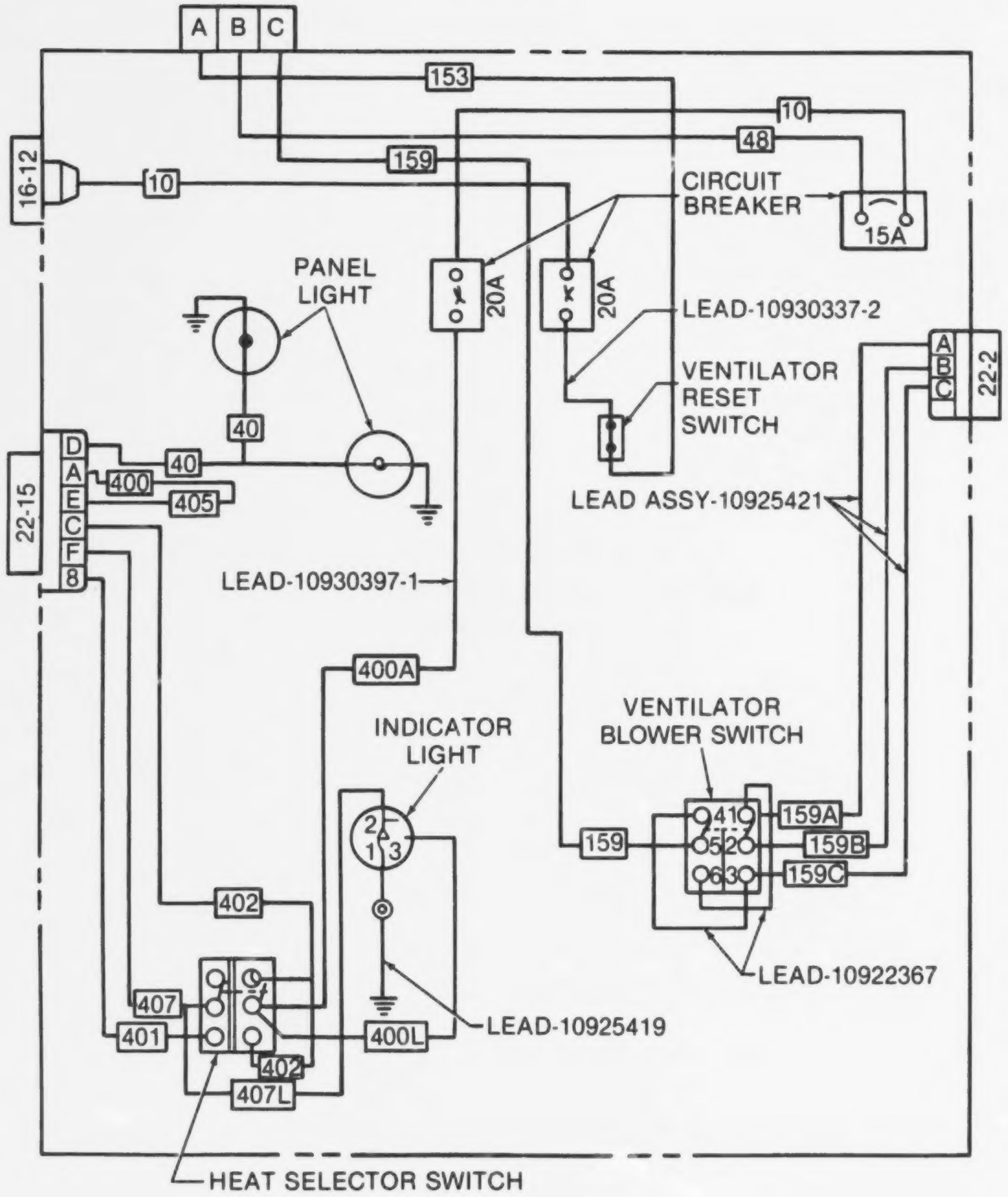
(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) (U/M)
73	O	8040-00-262-9026	ADHESIVE, RUBBER, MMM-A-1617, TYPE 1 (80244)	EA
74	O	6850-00-105-3084	CLEANING, COMPOUND PER MIL-C-81302	CN
75	O	8030-00-163-5792	SEALING, COMPOUND, TYPE II, GRADE N PER MIL-S-46163	BT

APPENDIX E
HYDRAULIC SYSTEM SCHEMATIC
(located in back of manual)

TA311249

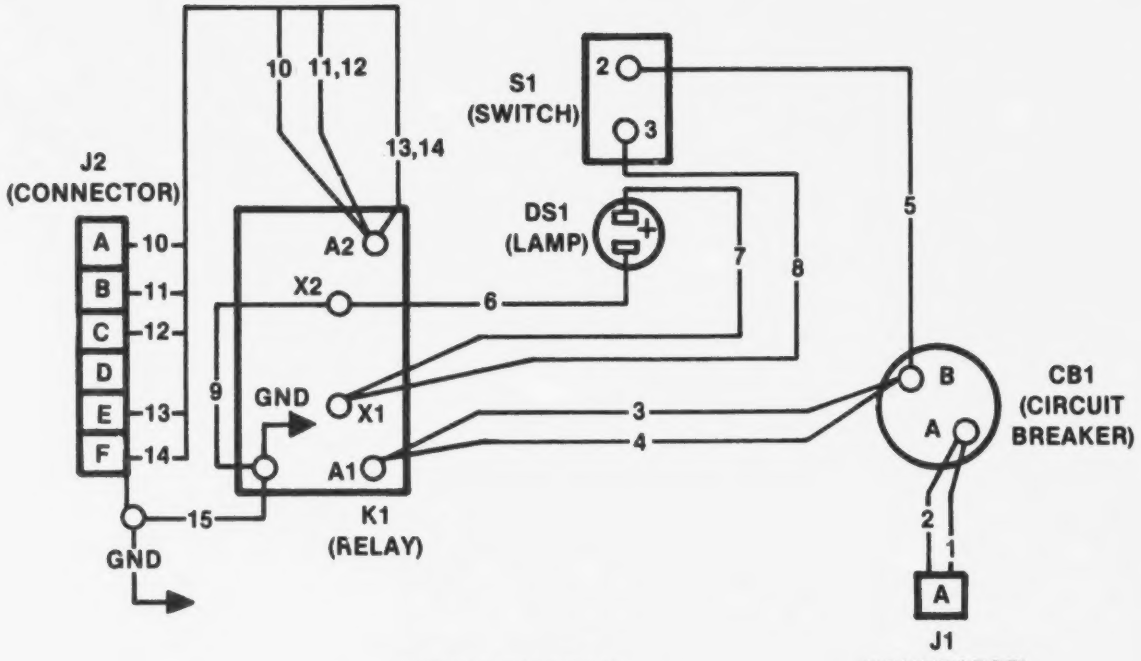
APPENDIX F
ELECTRICAL SYSTEM SCHEMATICS
(located in back of manual)

TA311277


A
B
C
153
10
48
159
16-12
10
CIRCUIT BREAKER
15A
PANEL LIGHT
20A
20A
LEAD-10930337-2
VENTILATOR RESET SWITCH
A
B
C
22-2
40
D
A
E
C
F
8
22-15
40
400
405
LEAD ASSY-10925421
LEAD-10930397-1
400A
INDICATOR LIGHT
VENTILATOR BLOWER SWITCH
2
1
3
4
1
5
2
6
3
159A
159B
159C
159
402
407
401
400L
402
407L
LEAD-10922367
LEAD-10925419
HEAT SELECTOR SWITCH

ACCESSORY CONTROL BOX ELECTRICAL SCHEMATIC DIAGRAM

TA311278


10
11,12
13,14
S1 (SWITCH)
2
3
J2 (CONNECTOR)
DS1 (LAMP)
A
B
C
D
E
F
10
11
12
13
14
A2
X2
6
7
8
5
9
GND
X1
A1
3
4
B
A
CB1 (CIRCUIT BREAKER)
15
GND
K1 (RELAY)
2
1
A
J1 (CONNECTOR)

WIRING DIAGRAM
VIEWED WITH COVER OPEN

NBC CONTROL BOX ELECTRICAL SCHEMATIC DIAGRAM

TA311251

APPENDIX G
ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I INTRODUCTION

GENERAL

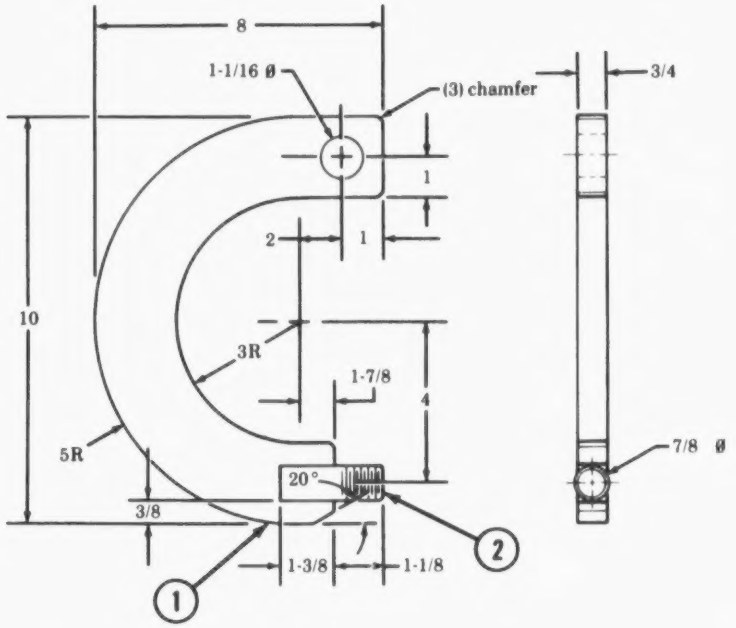
This appendix includes complete instructions for making items authorized to be manufactured or fabricated at organizational maintenance.

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.

All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

TA313175

Section II ILLUSTRATED LIST OF MANUFACTURED ITEMS



NOTES

1. Fabricate lifting device from 3/4 structural steel, ASTM-A-36.
2. Fabricate stud from machine bolt, P/N 90444-720.
3. Stud welded to lifting device.
4. Hexnut, P/N MS51967-27, to be installed on stud.
5. All dimensions given in inches.

PARTS LIST

NO.	AMT	NAME	PART NUMBER/SPECIFICATIONS
1	1	Lifting device	3/4 structural steel ASTM-A-36
2	1	Stud	90444-720
3	1	Hexnut	MS51967-27

Figure G-1. Stacker/Crane Lifting Device

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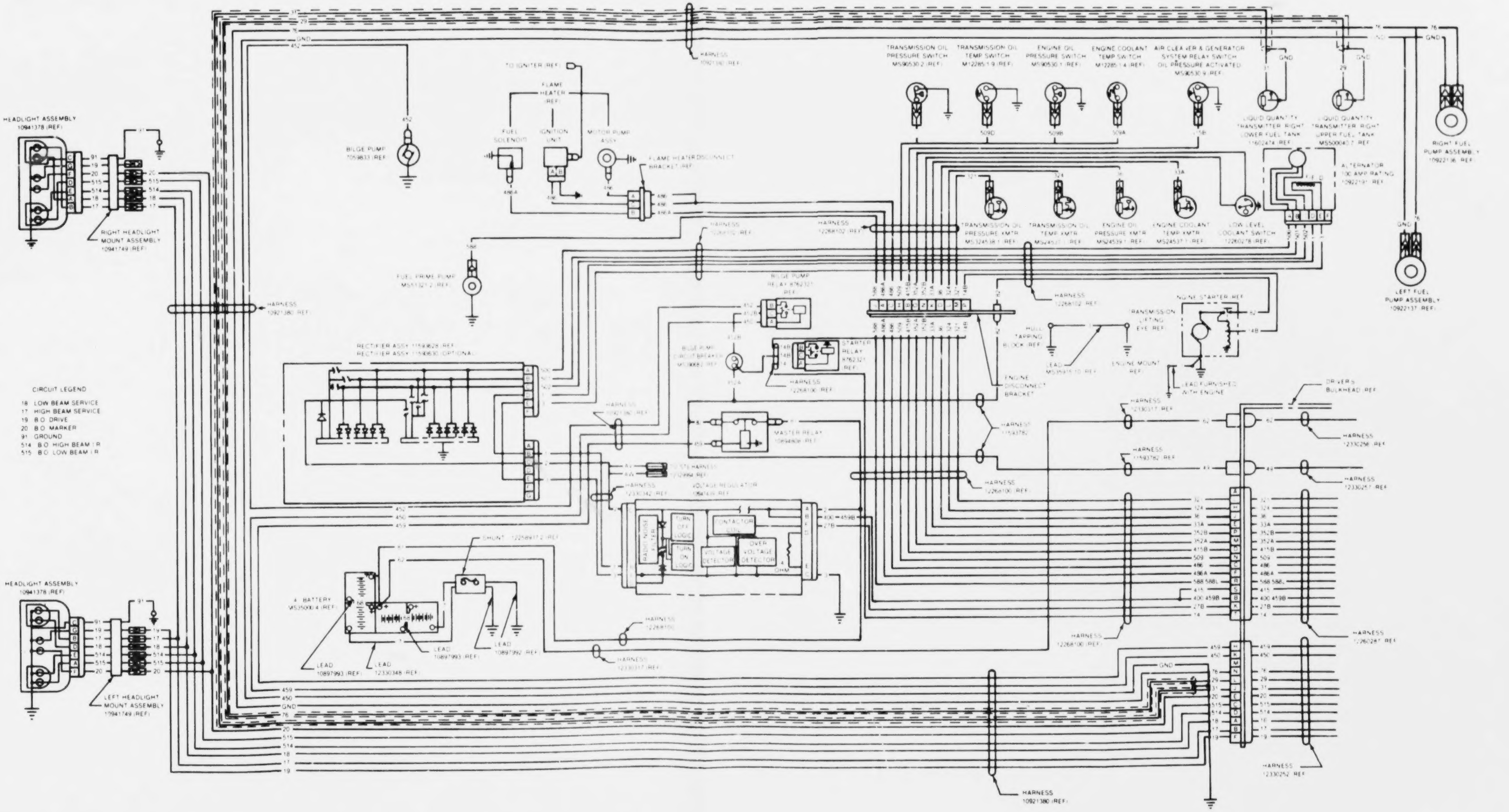
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MOTOR PUMP ASSY
FLAME HEATER DISCONNECT BRACKET (REF)
FUEL PRIME PUMP MS51321-2 (REF)
TRANSMISSION OIL PRESSURE SWITCH MS90530-2 (REF)
TRANSMISSION OIL TEMP SWITCH M12285/1-9 (REF)
ENGINE OIL PRESSURE SWITCH MS90530-1 (REF)
ENGINE COOLANT TEMP SWITCH M12285/1-4 (REF)
AIR CLEANER & GENERATOR SYSTEM RELAY SWITCH OIL PRESSURE ACTIVATED MS90530-9 (REF)
LIQUID QUANTITY TRANSMITTER RIGHT LOWER FUEL TANK 11602474 (REF)
LIQUID QUANTITY TRANSMITTER RIGHT UPPER FUEL TANK MS500040-7 (REF)
RIGHT FUEL PUMP ASSEMBLY 10922136 (REF)
ALTERNATOR 100 AMP RATING 10922191 (REF)
FIELD
LEFT FUEL PUMP ASSEMBLY 10922137 (REF)
TRANSMISSION OIL PRESSURE XMTR MS324538-1 (REF)
TRANSMISSION OIL TEMP XMTR MS24537-1 (REF)
ENGINE OIL PRESSURE XMTR MS24539-1 (REF)
ENGINE COOLANT TEMP XMTR MS24537-1 (REF)
LOW LEVEL COOLANT SWITCH 12260278 (REF)
HARNESS 12268102 (REF)
BILGE PUMP RELAY 8762321 (REF)
BILGE PUMP CIRCUIT BREAKER MS3888-2 (REF)
STARTER RELAY 8762321 (REF)
HARNESS 12268100 (REF)
ENGINE STARTER (REF)
TRANSMISSION LIFTING EYE (REF)
HULL TAPPING BLOCK (REF)
LEAD MS35915-10 (REF)
ENGINE MOUNT (REF)
LEAD FURNISHED WITH ENGINE
ENGINE DISCONNECT BRACKET
HARNESS 11593782
RECTIFIER ASSY 11593628 (REF)
RECTIFIER ASSY 11593630 (OPTIONAL)
MASTER RELAY 10894808 (REF)
TO STE HARNESS 12129994 (REF)
HARNESS 12330342 (REF)
VOLTAGE REGULATOR 10947439 (REF)
RADIO NOISE FILTER
TURN OFF LOGIC
TURN ON LOGIC
CONTACTOR COIL
VOLTAGE DETECTOR
OVER VOLTAGE DETECTOR
4 OHM
SHUNT 12258917-2 (REF)
(4) BATTERY MS35000-4 (REF)
LEAD 10897993 (REF)
LEAD 12330348 (REF)
LEAD 10897992 (REF)
HARNESS 12330317 (REF)
DRIVER'S BULKHEAD (REF)
HARNESS 12330258 (REF)
HARNESS 12330257 (REF)
HARNESS 12260287 (REF)
HARNESS 12330252 (REF)
HEADLIGHT ASSEMBLY 10941378 (REF)
LEFT HEADLIGHT MOUNT ASSEMBLY 10941749 (REF)
CIRCUIT LEGEND
18 LOW BEAM SERVICE
17 HIGH BEAM SERVICE
19 B.O. DRIVE
20 B.O. MARKER
91 GROUND
514 B.O. HIGH BEAM I.R.
515 B.O. LOW BEAM I.R.

TA57924

FO-1. VEHICLE ELECTRICAL SCHEMATIC DIAGRAM (SHT. 1 OF4)

Charts Transposed to

End of Volume.

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

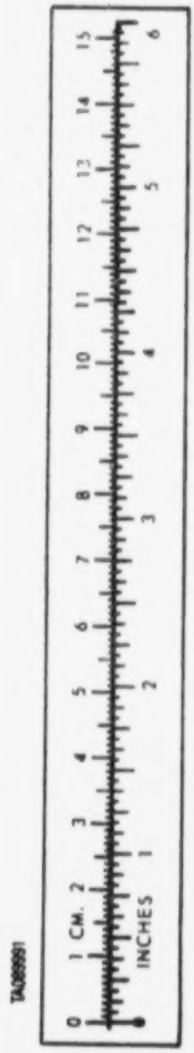
TEMPERATURE

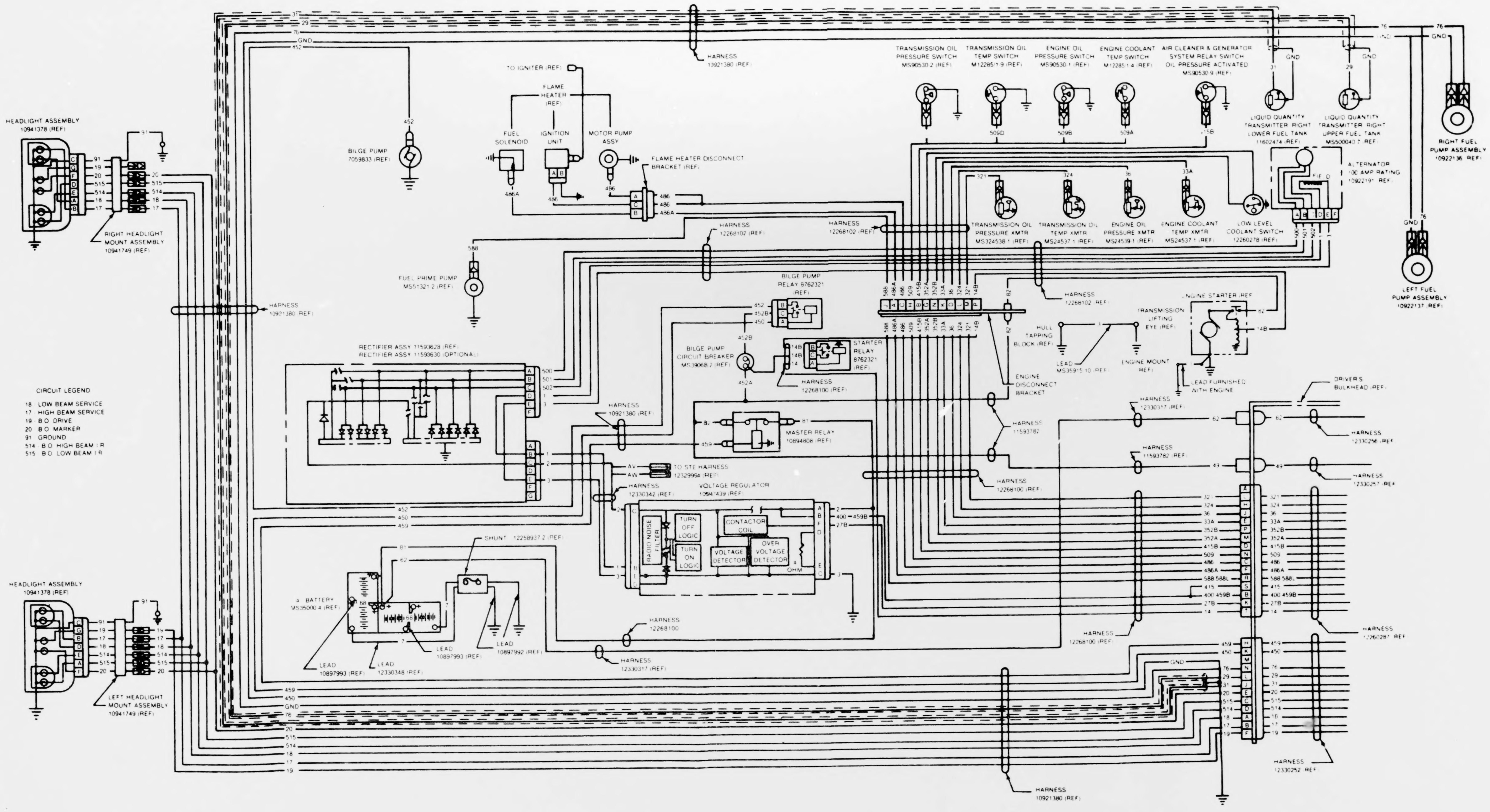
$^5/_9$(°F − 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
$^9/_5$(°C + 32) = °F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621




HEADLIGHT ASSEMBLY 10941378 (REF)
RIGHT HEADLIGHT MOUNT ASSEMBLY 10941749 (REF)
HARNESS 10921380 (REF)
HARNESS 13921380 (REF)
BILGE PUMP 7059833 (REF)
TO IGNITER (REF)
FLAME HEATER (REF)
FUEL SOLENOID
IGNITION UNIT
MOTOR PUMP ASSY
FLAME HEATER DISCONNECT BRACKET (REF)
HARNESS 12268102 (REF)
FUEL PRIME PUMP MS51321-2 (REF)
BILGE PUMP RELAY 8762321 (REF)
BILGE PUMP CIRCUIT BREAKER MS39068-2 (REF)
STARTER RELAY 8762321 (REF)
HARNESS 12268100 (REF)
MASTER RELAY 10894808 (REF)
RECTIFIER ASSY 11593628 (REF)
RECTIFIER ASSY 11593630 (OPTIONAL)
CIRCUIT LEGEND
18 - LOW BEAM SERVICE
17 - HIGH BEAM SERVICE
19 - B O DRIVE
20 - B O MARKER
91 - GROUND
514 - B O HIGH BEAM I R
515 - B O LOW BEAM I R
TO STE HARNESS 12329994 (REF)
HARNESS 12330342 (REF)
VOLTAGE REGULATOR 10947439 (REF)
RADIO NOISE FILTER
TURN OFF LOGIC
TURN ON LOGIC
CONTACTOR COIL
VOLTAGE DETECTOR
OVER VOLTAGE DETECTOR
4 OHM
SHUNT 12258937-2 (REF)
4 BATTERY MS35000-4 (REF)
LEAD 10897993 (REF)
LEAD 12330348 (REF)
LEAD 10897992 (REF)
HARNESS 12268100
HARNESS 12330317 (REF)
HEADLIGHT ASSEMBLY 10941378 (REF)
LEFT HEADLIGHT MOUNT ASSEMBLY 10941749 (REF)
TRANSMISSION OIL PRESSURE SWITCH MS90530-2 (REF)
TRANSMISSION OIL TEMP SWITCH M12285/1-9 (REF)
ENGINE OIL PRESSURE SWITCH MS90530-1 (REF)
ENGINE COOLANT TEMP SWITCH M12285/1-4 (REF)
AIR CLEANER & GENERATOR SYSTEM RELAY SWITCH OIL PRESSURE ACTIVATED MS90530-9 (REF)
LIQUID QUANTITY TRANSMITTER RIGHT LOWER FUEL TANK 11602474 (REF)
LIQUID QUANTITY TRANSMITTER RIGHT UPPER FUEL TANK MS500040-7 (REF)
RIGHT FUEL PUMP ASSEMBLY 10922136 (REF)
ALTERNATOR 100 AMP RATING 10922191 (REF)
FIELD
TRANSMISSION OIL PRESSURE XMTR MS324538-1 (REF)
TRANSMISSION OIL TEMP XMTR MS24537-1 (REF)
ENGINE OIL PRESSURE XMTR MS24539-1 (REF)
ENGINE COOLANT TEMP XMTR MS24537-1 (REF)
LOW LEVEL COOLANT SWITCH 12260278 (REF)
LEFT FUEL PUMP ASSEMBLY 10922137 (REF)
ENGINE STARTER (REF)
TRANSMISSION LIFTING EYE (REF)
HULL TAPPING BLOCK (REF)
LEAD MS35915-10 (REF)
ENGINE MOUNT (REF)
LEAD FURNISHED WITH ENGINE
ENGINE DISCONNECT BRACKET
HARNESS 11593782
HARNESS 11593782 (REF)
DRIVER'S BULKHEAD (REF)
HARNESS 12330256 (REF)
HARNESS 12330257 (REF)
HARNESS 12260287 (REF)
HARNESS 12330252 (REF)
HARNESS 10921380 (REF)
GND

TA57924

FO-1. VEHICLE ELECTRICAL SCHEMATIC DIAGRAM (SHT. 1 OF4)

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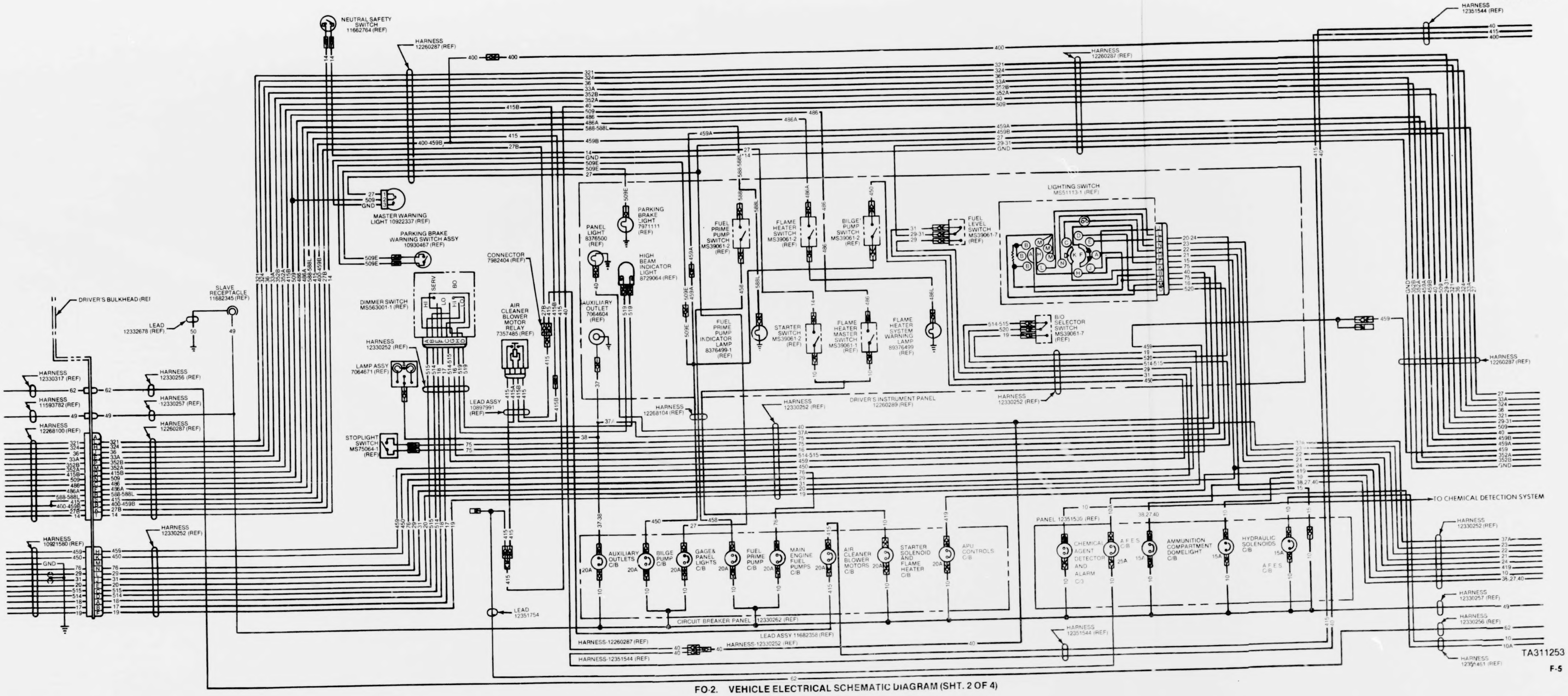
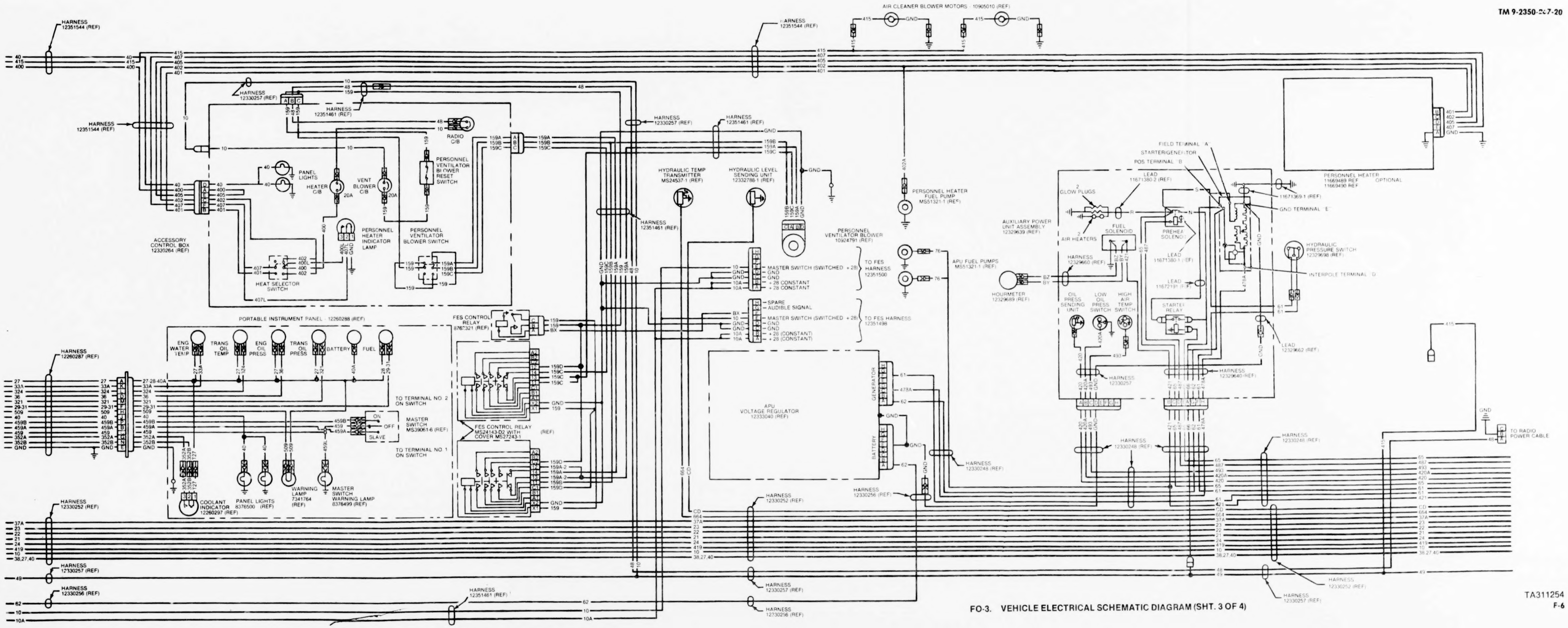
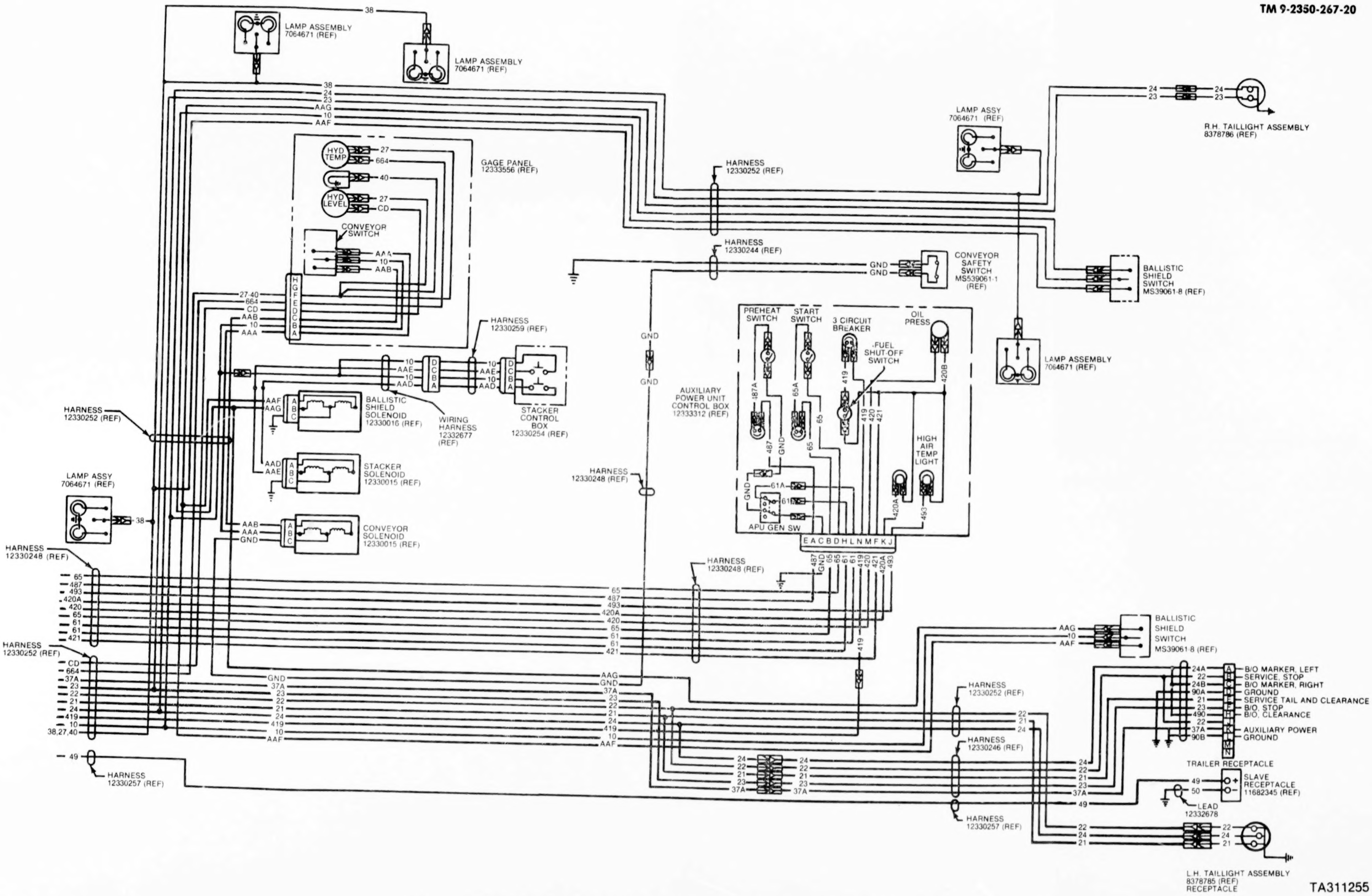

NEUTRAL SAFETY SWITCH 11662764 (REF)
HARNESS 12260287 (REF)
MASTER WARNING LIGHT 10922337 (REF)
PARKING BRAKE WARNING SWITCH ASSY 10930467 (REF)
DRIVER'S BULKHEAD (REF)
SLAVE RECEPTACLE 11682345 (REF)
LEAD 12332678 (REF)
DIMMER SWITCH MS563001-1 (REF)
SERV
BO
HI
LO
HARNESS 12330252 (REF)
LAMP ASSY 7064671 (REF)
CONNECTOR 7982404 (REF)
AIR CLEANER BLOWER MOTOR RELAY 7357485 (REF)
LEAD ASSY 10897991 (REF)
STOPLIGHT SWITCH MS75064-1 (REF)
HARNESS 12330317 (REF)
HARNESS 11593782 (REF)
HARNESS 12268100 (REF)
HARNESS 10921580 (REF)
HARNESS 12330256 (REF)
HARNESS 12330257 (REF)
GND
LEAD 12351754
PANEL LIGHT 8376500 (REF)
PARKING BRAKE LIGHT 7971111 (REF)
HIGH BEAM INDICATOR LIGHT 8729064 (REF)
AUXILIARY OUTLET 7064604 (REF)
FUEL PRIME PUMP SWITCH MS39061-2 (REF)
FUEL PRIME PUMP INDICATOR LAMP 8376499-1 (REF)
FLAME HEATER SWITCH MS39061-2 (REF)
BILGE PUMP SWITCH MS39061-2 (REF)
STARTER SWITCH MS39061-2 (REF)
FLAME HEATER MASTER SWITCH MS39061-1 (REF)
FLAME HEATER SYSTEM WARNING LAMP 89376499 (REF)
FUEL LEVEL SWITCH MS39061-7 (REF)
LIGHTING SWITCH MS51113-1 (REF)
B/O SELECTOR SWITCH MS39061-7 (REF)
HARNESS 12268104 (REF)
DRIVER'S INSTRUMENT PANEL 12260289 (REF)
AUXILIARY OUTLETS C/B
BILGE PUMP C/B
GAGE& PANEL LIGHTS C/B
FUEL PRIME PUMP C/B
MAIN ENGINE FUEL PUMPS C/B
AIR CLEANER BLOWER MOTORS C/B
STARTER SOLENOID AND FLAME HEATER C/B
APU CONTROLS C/B
20A
CIRCUIT BREAKER PANEL 12330262 (REF)
LEAD ASSY 11682358 (REF)
HARNESS-12260287 (REF)
HARNESS-12330252 (REF)
HARNESS-12351544 (REF)
PANEL 12351530 (REF)
CHEMICAL AGENT DETECTOR AND ALARM C/B
A F E S C/B
25A
AMMUNITION COMPARTMENT DOMELIGHT C/B
15A
HYDRAULIC SOLENOIDS C/B
TO CHEMICAL DETECTION SYSTEM
HARNESS 12351544 (REF)
HARNESS 12351461 (REF)
TA311253

FO-2. VEHICLE ELECTRICAL SCHEMATIC DIAGRAM (SHT. 2 OF 4)


HARNESS 12351544 (REF)
40
415
400
407
405
402
401
10
48
159
HARNESS 12330257 (REF)
HARNESS 12351461 (REF)
RADIO C/B
PANEL LIGHTS
HEATER C/B
20A
VENT BLOWER C/B
PERSONNEL VENTILATOR BLOWER RESET SWITCH
159A
159B
159C
ACCESSORY CONTROL BOX 12330264 (REF)
PERSONNEL HEATER INDICATOR LAMP
400L
407L
GND
PERSONNEL VENTILATOR BLOWER SWITCH
HEAT SELECTOR SWITCH
AIR CLEANER BLOWER MOTORS - 10905010 (REF)
HYDRAULIC TEMP TRANSMITTER MS24537-1 (REF)
HYDRAULIC LEVEL SENDING UNIT 12332788-1 (REF)
402A
PERSONNEL HEATER FUEL PUMP MS51321-1 (REF)
PERSONNEL VENTILATOR BLOWER 10924791 (REF)
MASTER SWITCH (SWITCHED +28)
+28 CONSTANT
TO FES HARNESS 12351500
SPARE
AUDIBLE SIGNAL
+28 (CONSTANT)
TO FES HARNESS 12351498
APU FUEL PUMPS MS51321-1 (REF)
76
HOURMETER 12329689 (REF)
BZ
BY
AUXILIARY POWER UNIT ASSEMBLY 12329639 (REF)
2 GLOW PLUGS
2 AIR HEATERS
LEAD 11671380-2 (REF)
FUEL SOLENOID
HARNESS 12329660 (REF)
PREHEAT SOLENOID
LEAD 11671380-1 (REF)
LEAD 11672191 (REF)
FIELD TERMINAL "A"
STARTER/GENERATOR
POS TERMINAL "B"
11671369-1 (REF)
GND TERMINAL "E"
INTERPOLE TERMINAL "D"
HYDRAULIC PRESSURE SWITCH 12329698 (REF)
OIL PRESS SENDING UNIT
LOW OIL PRESS SWITCH
HIGH AIR TEMP SWITCH
STARTER RELAY
LEAD 12329662 (REF)
HARNESS 12330257
HARNESS 12329640 (REF)
PERSONNEL HEATER 11669489 REF 11669490 REF OPTIONAL
PORTABLE INSTRUMENT PANEL - 12260288 (REF)
ENG WATER TEMP
TRANS OIL TEMP
ENG OIL PRESS
TRANS OIL PRESS
BATTERY
FUEL
FES CONTROL RELAY 8762321 (REF)
HARNESS 12260287 (REF)
27
33A
324
36
321
29-31
509
459B
459A
459
352A
352B
27-28-40A
TO TERMINAL NO. 2 ON SWITCH
MASTER SWITCH MS39061-6 (REF)
ON
OFF
SLAVE
TO TERMINAL NO. 1 ON SWITCH
FES CONTROL RELAY MS24143-D2 WITH COVER MS27243-1 (REF)
159D
159A-2
COOLANT INDICATOR 12260297 (REF)
PANEL LIGHTS 8376500 (REF)
WARNING LAMP 7341764 (REF)
MASTER SWITCH WARNING LAMP 8376499 (REF)
459L
APU VOLTAGE REGULATOR 12333040 (REF)
GENERATOR
BATTERY
61
478A
62
HARNESS 12330248 (REF)
HARNESS 12330256 (REF)
HARNESS 12330252 (REF)
CD
664
37A
23
22
21
24
419
38,27,40
49
65
487
493
420A
420
421
TO RADIO POWER CABLE
10A

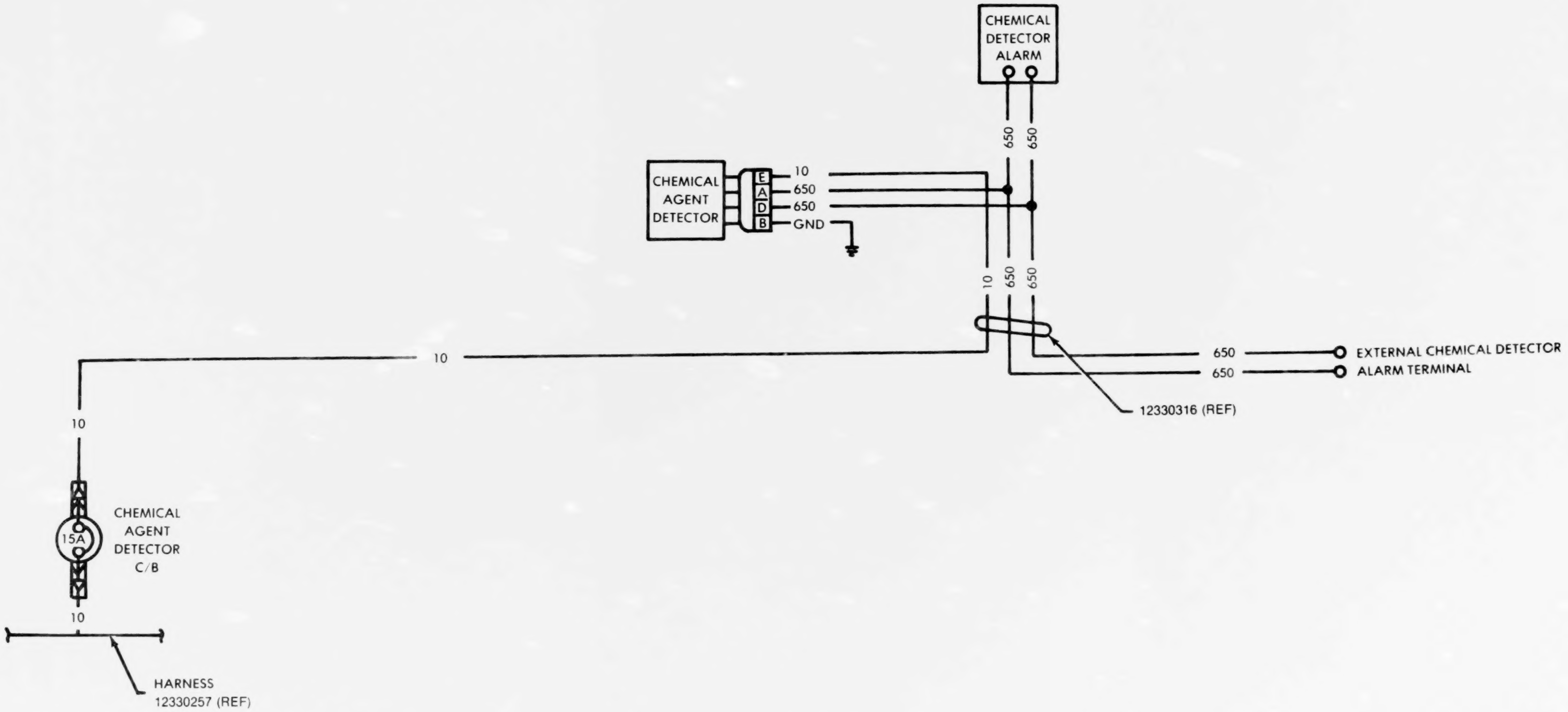
FO-3. VEHICLE ELECTRICAL SCHEMATIC DIAGRAM (SHT. 3 OF 4)

TA311254


LAMP ASSEMBLY 7064671 (REF)
LAMP ASSEMBLY 7064671 (REF)
GAGE PANEL 12333556 (REF)
HYD TEMP
HYD LEVEL
CONVEYOR SWITCH
HARNESS 12330252 (REF)
HARNESS 12330244 (REF)
HARNESS 12330259 (REF)
CONVEYOR SAFETY SWITCH MS539061-1 (REF)
LAMP ASSY 7064671 (REF)
R.H. TAILLIGHT ASSEMBLY 8378786 (REF)
BALLISTIC SHIELD SWITCH MS39061-8 (REF)
LAMP ASSEMBLY 7064671 (REF)
STACKER CONTROL BOX 12330254 (REF)
WIRING HARNESS 12332677 (REF)
BALLISTIC SHIELD SOLENOID 12330016 (REF)
STACKER SOLENOID 12330015 (REF)
CONVEYOR SOLENOID 12330015 (REF)
HARNESS 12330252 (REF)
LAMP ASSY 7064671 (REF)
HARNESS 12330248 (REF)
HARNESS 12330252 (REF)
HARNESS 12330257 (REF)
HARNESS 12330248 (REF)
AUXILIARY POWER UNIT CONTROL BOX 12333312 (REF)
PREHEAT SWITCH
START SWITCH
3 CIRCUIT BREAKER
OIL PRESS
FUEL SHUT-OFF SWITCH
HIGH AIR TEMP LIGHT
APU GEN SW
HARNESS 12330248 (REF)
BALLISTIC SHIELD SWITCH MS39061-8 (REF)
B/O MARKER, LEFT
SERVICE, STOP
B/O MARKER, RIGHT
GROUND
SERVICE TAIL AND CLEARANCE
B/O, STOP
B/O, CLEARANCE
AUXILIARY POWER
GROUND
HARNESS 12330252 (REF)
HARNESS 12330246 (REF)
TRAILER RECEPTACLE
SLAVE RECEPTACLE 11682345 (REF)
LEAD 12332678
HARNESS 12330257 (REF)
L.H. TAILLIGHT ASSEMBLY 8378785 (REF) RECEPTACLE

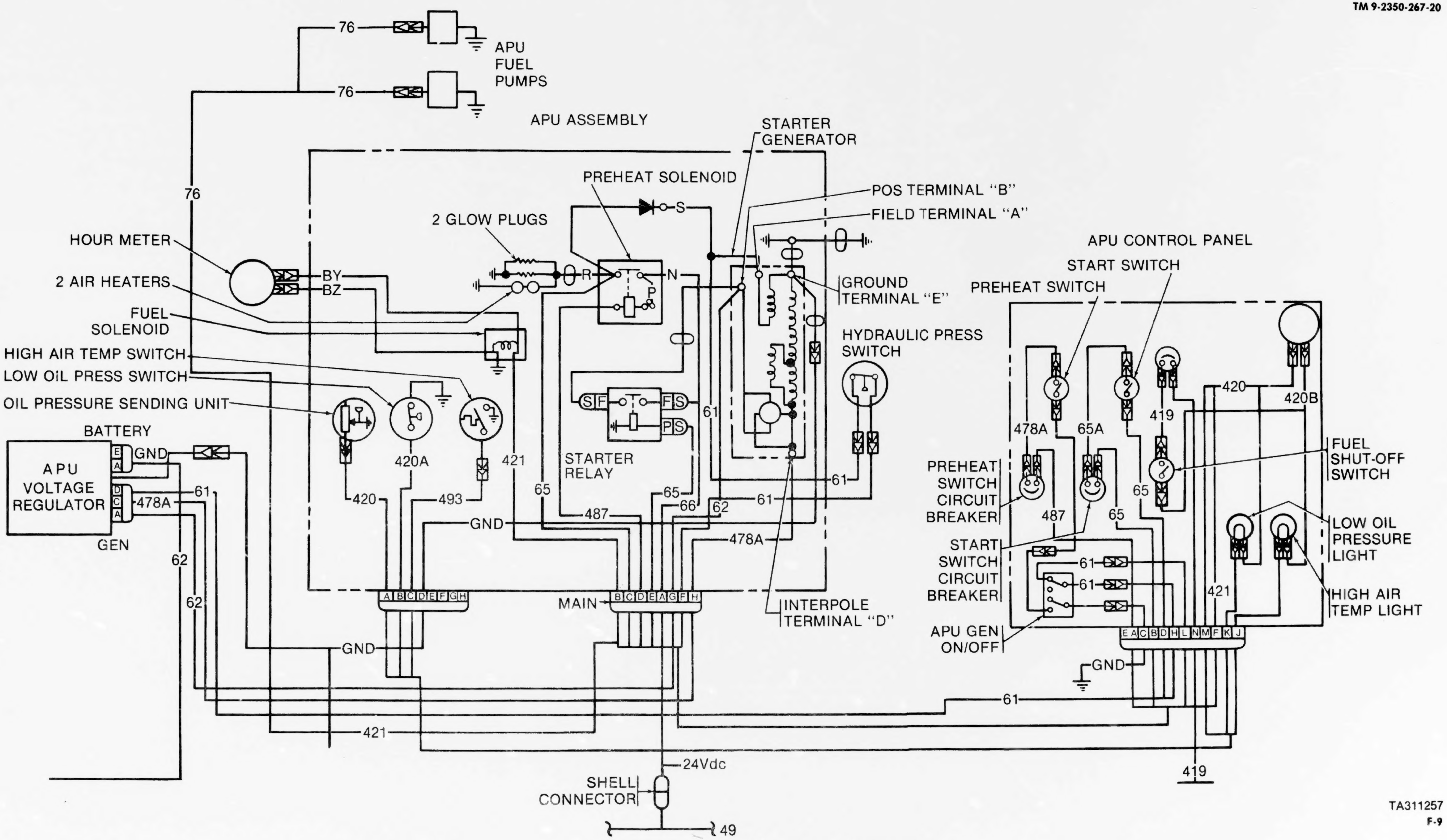
TA311255

FO-4. VEHICLE ELECTRICAL SCHEMATIC DIAGRAM (SHT. 4 OF 4)

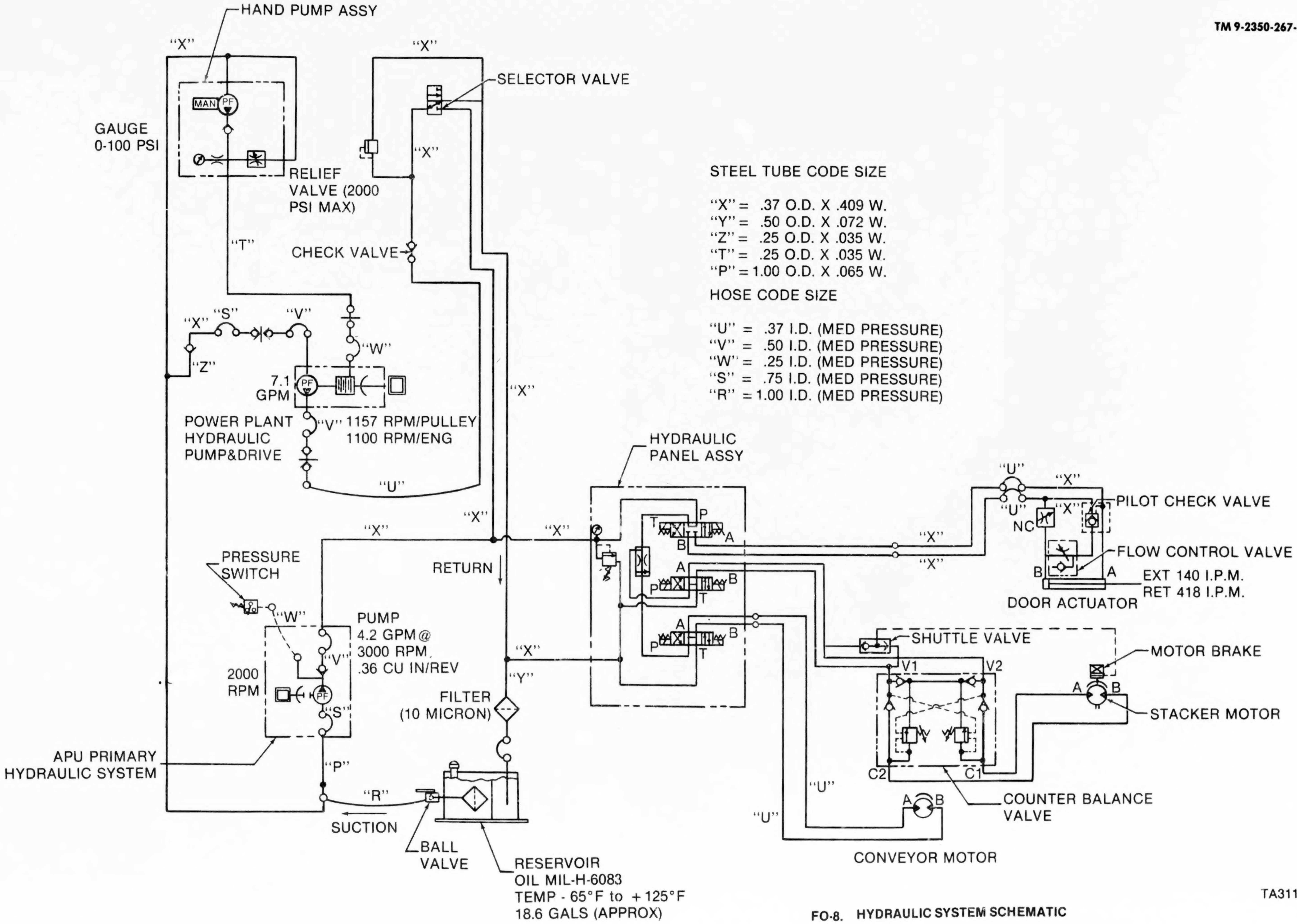

CHEMICAL DETECTOR ALARM
650
650
CHEMICAL AGENT DETECTOR
E
A
D
B
10
650
650
GND
10
650
650
10
650
650
EXTERNAL CHEMICAL DETECTOR ALARM TERMINAL
12330316 (REF)
10
15A
CHEMICAL AGENT DETECTOR C/B
10
HARNESS 12330257 (REF)

TA311256

FO-5. CHEMICAL AGENT DETECTOR ALARM ELECTRICAL SCHEMATIC


APU FUEL PUMPS
76
76
76
APU ASSEMBLY
STARTER GENERATOR
PREHEAT SOLENOID
POS TERMINAL "B"
FIELD TERMINAL "A"
2 GLOW PLUGS
S
R
N
P
HOUR METER
BY
BZ
2 AIR HEATERS
FUEL SOLENOID
HIGH AIR TEMP SWITCH
LOW OIL PRESS SWITCH
OIL PRESSURE SENDING UNIT
GROUND TERMINAL "E"
HYDRAULIC PRESS SWITCH
APU CONTROL PANEL
START SWITCH
PREHEAT SWITCH
S F
F S
P S
STARTER RELAY
BATTERY
APU VOLTAGE REGULATOR
E A D C A
GND
GEN
61
478A
62
62
420A
420
493
421
65
487
GND
65
66
62
61
61
61
478A
420
420B
478A
65A
419
65
PREHEAT SWITCH CIRCUIT BREAKER
487
65
FUEL SHUT-OFF SWITCH
LOW OIL PRESSURE LIGHT
START SWITCH CIRCUIT BREAKER
61
61
421
HIGH AIR TEMP LIGHT
APU GEN ON/OFF
A B C D E F G H
MAIN
B C D E A G F H
INTERPOLE TERMINAL "D"
E A C B D H L N M F K J
GND
GND
61
421
419
24Vdc
SHELL CONNECTOR
49
TA311257

FO-6. APU & APU CONTROL PANEL ELECTRICAL SCHEMATIC


HAND PUMP ASSY
"X"
"X"
SELECTOR VALVE
MAN
PF
GAUGE
0-100 PSI
"X"
RELIEF
VALVE (2000
PSI MAX)
"T"
CHECK VALVE
"X"
"S"
"V"
"W"
"Z"
7.1
GPM
PF
"X"
POWER PLANT
HYDRAULIC
PUMP&DRIVE
"V"
1157 RPM/PULLEY
1100 RPM/ENG
"U"
HYDRAULIC
PANEL ASSY
"X"
"X"
"X"
P
T
A
B
A
B
P
T
A
B
P
T
"U"
"X"
"U"
"X"
NC
PILOT CHECK VALVE
"X"
"X"
FLOW CONTROL VALVE
B
A
EXT 140 I.P.M.
RET 418 I.P.M.
DOOR ACTUATOR
PRESSURE
SWITCH
RETURN
"W"
PUMP
4.2 GPM@
3000 RPM
.36 CU IN/REV
"V"
2000
RPM
PF
"S"
"X"
"Y"
FILTER
(10 MICRON)
SHUTTLE VALVE
MOTOR BRAKE
V1
V2
A
B
STACKER MOTOR
C2
C1
COUNTER BALANCE
VALVE
"U"
"U"
A
B
CONVEYOR MOTOR
APU PRIMARY
HYDRAULIC SYSTEM
"P"
"R"
SUCTION
BALL
VALVE
RESERVOIR
OIL MIL-H-6083
TEMP - 65°F to +125°F
18.6 GALS (APPROX)

STEEL TUBE CODE SIZE

"X" = .37 O.D. X .409 W.
"Y" = .50 O.D. X .072 W.
"Z" = .25 O.D. X .035 W.
"T" = .25 O.D. X .035 W.
"P" = 1.00 O.D. X .065 W.

HOSE CODE SIZE

"U" = .37 I.D. (MED PRESSURE)
"V" = .50 I.D. (MED PRESSURE)
"W" = .25 I.D. (MED PRESSURE)
"S" = .75 I.D. (MED PRESSURE)
"R" = 1.00 I.D. (MED PRESSURE)

TA311250

FO-8. HYDRAULIC SYSTEM SCHEMATIC